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THE PHILOSOPHICAL REVIEW

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THE PHILOSOPHICAL REVIEW

GERAUD DE CORDEMOY, 1600–1684

I

IN order to distinguish the soul and the body, states Bouillier,[1] Cordemoy maintains 'en bon cartésien' that the existence of the soul is more assured than that of the body. Moreover, as Bouillier adds, the existence of the body can become assured only through faith. But these points, with which the historian of Cartesianism concludes his account of Cordemoy, would more properly be used in an introduction. The distinction of soul and body is recognized by Cordemoy as the very first step in metaphysics and epistemology. It is this, however, because through it alone can we arrive at physics. Cordemoy's *Le Discernement du corps et de l'âme* carries a most significant sub-title, *Pour servir à l'éclaircissement de la Physique*. There could scarcely be found a more emphatic contemporary statement concerning the vital bearings upon physical science of the dualism of body and soul effected by Descartes. The directly perceptual world of Aristotle and mediæval tradition—after all it is only the commonsense world—is certainly the world that science must explain. The beginnings of modern science come with the recognition that mind had not been very successful in explaining this perceptual world in the terms which it directly suggests. The task of the first modern scientists was twofold: it was necessary to define the subject-matter of inquiry in terms of the concepts and methods to be employed, and simultaneously to determine the concepts and methods through a definition of the subject-matter. The subject-matter is nature or the physical world, of course, but the problem was to

[1] *Hist. de la phil. cartésienne*, Paris, 1868, 3d ed., vol. I, p. 516.

decide upon just what is to be meant by the term 'nature'. This must be defined by determining the objectives of science; the objectives could be defined only in terms of concepts and methods—and this in turn fixed a content for the term 'nature'. The objective was a quantitative knowledge of a qualitative world, or at least of a nature whose mask is qualitative. The problem of the commonsense and perceptual world must be attacked circuitously, by a flanking manœuvre. The problem once solved, physics will be a science of nature by means of which we may understand how the perceiver comes to have the world that he perceives, in relation with a world he does not perceive. Before this can be accomplished, however, the perceiver must be recognized for what he is, in order that the province of physics may be defined. This province, once defined, must necessarily include the human body. The human being, like everything else, is a portion of the commonsense and perceptual world and is also a fact within the province of physics. Since the human being, again, is the perceiver, the distinguishing of the directly perceptual world from the world that will be studied in physics may well begin with him. Thus the discerning of mind from body is a preliminary step that serves for the clarification of physics. As the satirical and peripatetic Jesuit, Daniel, remarks, the world of Descartes is well ordered, and freed from an "infinité d'accidens, de qualitez, d'especes intentionelles".[2]

The successors of Descartes were concerned with the problem of mind and body for more than one reason. On the one hand, they were interested because of moral and theological reasons; and then the problem is metaphysical in its own right, so to speak. On the other hand, they were sometimes interested in the mind-body problem because of an even deeper interest in physical science; in this case a satisfactory conception of mind and body was a preparation for physics. To begin with, the dualism was to free physical science of many encumbrances. To return to it from the excursion into physics was, of course, to re-encounter a difficulty. But since we can be more assured of the existence of

[2] *Voyage du Monde de Descartes*, nouvelle édition, Paris, chez Nicolas Pepie, 1702, p. 4.

the soul than of the body, theology may provide a solution of the problem.

Geraud de Cordemoy, whatever fund of tradition he may have brought to the study of Descartes, did not fail to perceive the impact of the Cartesian dualism upon traditional ideas. If the discerning of soul and body leads to an *élaïrcissement* for physics, he thinks it leads also to a just appraisement of older conceptions. He is not misled by the doctrine of animal spirits or by the definition of spirit as subtle matter. Nor will the notion of 'Form' bridge the gap between soul and body. He uses the conception of the animal spirits, for example, but it is a purely physical and physiological principle; fluidity and subtlety are not signs of an approximation to spirit. If the principle that moves animals, he affirms, is to be called *âme* or *forme,* this principle is by no means identical with *esprit,* which is separable from the body.[2] Cordemoy's task, indeed, is precisely to assign to soul that which belongs to it and to body that which belongs to body. This task is defined by taking seriously the Cartesian dualism of spiritual and extended substance. If body be extension, then the human body is extension. And all that is not extension must be attributed to the soul. Thus the realm of physical inquiry is defined. For we must note that this discerning of body and soul is not undertaken in the interests of psychology, or of metaphysics, or of theology, but of Physics—*Pour servir à l'éclaircissement de la Physique,* as the title informs us. The Cartesian ideal of an universal physics, and the Cartesian conviction that the human mind is capable of it, are shared by Cordemoy. To realize the ideal and justify the conviction, we must first know what the soul encompasses.

And so Cordemoy states the following principles:

> If I think in any fashion whatever, it is because I have a soul. "Si ie conçoy diversement les differens objets; si dès l'abord i'en apperçoy quelque chose; si pour les mieux connoistre ie les considère plus long-temps; si après avoir discontinue ie récommence:

[2] *Traité de Métaphysique,* p. 107, in *Les Oeuvres du feu M. de Cordemoy,* Conseiller du Roy, etc., Paris, Remy, 1704. This volume is hereinafter referred to as *O.* All references to *Le Discernement du corps et de l'âme en six discours, Pour servir à l'éclaircissement de la Physique,* are to the edition of 1666, chez Florentin Lambert, hereinafter indicated by *D.*

> En un mot, si i'ay des *idées*, des *perceptions* de *l'attention*, & de la mémoire; c'est que i'ay une Âme."
>
> If I consider my own thoughts or those of others, he continues, if I consider truth, and many other things that have nothing to do with extension ("qui ne tiennent rien de l'étendue, de la figure, ny du mouvement"): if I am capable of conceiving purely intelligible things, it is because I have a soul.
>
> If I consider the things that depend upon extension, figure and motion, in a word, if I am capable of imagining, it is because I have a soul.
>
> If I judge, whether the object be corporeal or spiritual, it is because I have a soul.
>
> If I doubt, it is because I have a soul, and a soul which lacks something.
>
> If I am free in my judgments, if I have a will capable of good or bad, if I have liberty in my volitions, it is because I have a soul.
>
> If I love, hate, experience sadness, if I have desires, it is because I have a soul.[4]

Thus the province of Physics is made clear. "Everything that we admire in the works of Art, or of Nature, is a pure effect of movement and of arrangement. But in order that we may be able to know this by means of examples, I think I can choose examples that will best convince us, a watch and the body of man. Everyone is sufficiently persuaded that the arrangement of the parts of a watch is the cause of all its effects . . . we need not seek *form, faculties, occult virtues,* nor *qualities* in it."[5] We are, indeed, assured that the watch is not animated (*animée*) *for the very reason that an explanation in terms of motion and arrangement is possible.* This clarification of the field of physics, we note, has two sides. On the one hand, thought may dispense with the terminology of the School and its implications; on the other hand, by the attribution to the soul of everything that is not extension, figure, and motion, nature as the field of physical inquiry is simplified and its universal features revealed.

This confident determination of the subject-matter is but the other side of an assurance of human capacity for knowledge.

[4] *D*, pp. 146–151.

[5] *D*, pp. 59–60.

Heine somewhere tells how Voltaire in a letter to Mme. de Deffand professes that he is enraptured by her remark to the effect that such things, if there be any, which men can *not* come to know are certainly of such a kind that knowledge of them would be of no importance to man. There is in this a boundless confidence in human capacity, even with that qualification of utility. For Cordemoy, in an earlier day, there is little doubt in the competence of reason. The fact that thought could so easily determine the field of physics is evidence of its capacity to constitute the science. Perhaps, he says, our power of knowing, at least in this world, may not be so great. But it is certain that we have enough for knowledge, and that we shall not lack it if we use well our light and our power of not judging until we really know. God has given us "toutes les lumières dont nous avons besoin". We have "les idées très-distinctes" for knowing the things of nature, in so far as it is useful to know them. What then is this utility? Cordemoy explains that our knowledge of things, or the knowledge we may obtain if we will, is such that we can recognize them as useful or harmful, even if we cannot know what they are. To know what things are, he explains in a note, means to know what are figure, situation, or the movements of the insensible parts of things.[6] The adequacy of our knowledge is assured by the "notions parfaites" that God has given the soul, whether for the purpose of knowing itself, or of knowing its body, or of knowing that marvellous relation which constitutes their union. Indeed, for such knowledge all that is needed is the reflexion of the soul on that which it is, on itself; and by the same means it may know, so far as is useful to it, everything which composes the universe. This possibility of knowledge extends not only to nature and to man, but even to God. And so Cordemoy thinks of a philosophy capable of making a "juste discernement" of everything, and of reasoning on foundations other than our prejudices. No one can commence better than by beginning with that which he possesses in himself and by the examination of all the ideas he has of the soul and of the body.[7]

What, then, for Cordemoy, is this field of physics for which he

[6] *O, Un discours physique de la parole*, pp. 74–5.
[7] *D, Préface.*

has provided an "éclaircissement"? And the soul, discerned as distinct from the body, what is it? What, as a branch of universal physics, is the physics of the body? And what is this marvellous connexion that obtains between body and soul? What is the secret of their union, of which he speaks in the Dedication to the King?

II

Let us first turn to the field of physics. The problem of knowledge as the task of organizing a universal science of nature requires first of all the discovery of the least common denominators of things. In a sense (as we have learned from Cordemoy already) we cannot know the nature of these common denominators. What figure is—that we cannot know. There are then certain ultimate facts in terms of which we may know things, but which, in themselves, remain brute given facts. What are these?

It is difficult to resist the inference that Cordemoy's physics is as much a reaction against Cartesian doctrine as an adoption of it. Descartes, defining matter as a substance the essence of which is extension, furnished a conceptual common denominator of the stuff of things. In this definition the manyness of things tends to be obliterated. In terms of tradition, a thing and a substance are somehow one and the same. The number of substances is the number of things. But Descartes had reduced them to one, so far as the system of nature is concerned. In the *tourbillon* theory he was doubtless endeavoring, among other aims, to provide a scientific means of thinking of the manyness of things, of the particular, in connexion with the oneness of all things with respect to substance. Cordemoy seems to have felt that physics was in danger of eliminating the differentiations of things. He does not directly refer to Descartes, but directs his objections against what seemed to him to be a widespread opinion among the physicists.

It is therefore Bodies in the plural, rather than extended substance, that is fundamental for Cordemoy. Every body is an extended substance. And matter is an assemblage of bodies. "On sçait qu'il y a des Corps & que le nombre en est presque infiny: On sçait aussi qu'il y a de la matière; mais il me semble que l'on n'en a pas des notions assez distinctes, & que c'est de la

que viennent presque toutes les érreurs de la Physique ordinaire." [8] But the term 'body' does not stand for the thing of common sense. Its meaning for Cordemoy, indeed, would be better indicated by the term 'atom'. Matter is a composite of bodies, and everything of common experience is a *portion* of matter. There is a great difference between a *part* of matter and a *portion*. Every body, he says, considered as entering within the assemblage of material things, is a *part* of matter.[9] Bodies then are extended substances, and they are the units of composition. The composites are things, and these are portions of matter. Matter, it seems, is a collective term for all physical things, rather than that of which they are composed. The units of composition, defined as extended substances, are *indivisible because each is a single substance*. Each excludes all others, and so they are characterized by impenetrability. Each body, since it is extended, must have that extension *terminated*—otherwise there would not be many bodies, but one. This termination of a body is its figure. Relations of situation obtaining between bodies define their place, and alterations of these relations mean that they move. From these definitions it follows that Cordemoy repudiates infinite divisibility. This fallacy, he thinks, has arisen because people have confused the notion of matter in general and the thought of particular things, and have concluded from divisibility into imperceptible portions the infinite divisibility of matter.[10] No unit-body by itself can affect our sense-organs. Hence it follows that what we perceive is matter, not bodies, *i.e.* assemblages of unit-bodies rather than the units themselves. Even great men have committed the fallacy of confusing matter and body, and so have attributed to matter that which properly belongs to body, *i.e.* have said that it is a substance and that it is extended.[11] Cordemoy recounts several "inconveniences" that follow from this fallacy. It is obvious, however, that the fundamental difficulty he finds in a physics resting on this error is its inability to explain movement and rest. In the continuity of matter, when defined as one sub-

[8] *D*, p. 1.
[9] *D*, pp. 2–3.
[10] *D*, pp. 4–5.
[11] *D*, p. 8. *Cf.* p. 15.

stance the essence of which is extension, there is no room for the differentiation of one thing from another, and so no separation of things. And without this separation neither motion nor rest is intelligible. To Cordemoy, it would seem, the Cartesian maxim, to the effect that the infinity of figures would suffice to explain the diversity of things, was unintelligible on a basis of the Cartesian reduction of nature to one extended substance. He does not, so far as I have noticed, literally state that extension constitutes the essence of substances. Extension belongs to or pertains to body; every body is an extended substance. But the plurality of bodies makes difficult the assertion that extension defines their essence. His thought seems to be that a particular extension, whose 'termination' makes a particular 'figure', is that which defines the essence of a body. The figures of bodies are diverse, and so their combination to make portions of matter, or things, leads to the different figures of things. Since some of the bodies have similar figures, there are portions (things) that are similar in figure.[12] Finally, if we use the terms 'quality' and 'form' they can mean only the different arrangements of the parts of matter, and nothing else.

Another Cartesian, with almost an official position as the expounder of Cartesian doctrine, expresses a recognition of the same difficulties. Régis seeks to provide a place for the particular by distinguishing between primary matter and the particular as differentiated within universal extension. By the term 'Matière première' we must understand

> le sujet de toutes les formes . . . de tout ce qui se trouve dans les corps particuliers par quoy ils diffèrent les uns des autres. . . . Or la matiere premiere ne diffère de la quantité qu'en ce que la quantité est une substance étendue considérée comme telle ou telle selon la grandeur; au lieu que la matiere premiere est cette même substance étendue considérée comme capable de recevoir des modifications qui font qu'elle est un corps de telle ou de telle nature. Ainsi, par example, dans un morceau de cire, l'étendue considérée en elle-même est ce qu'on appelle *Corps*, l'étendue considérée come telle ou telle selon la grandeur est ce qu'on nomme *Quantité*, & cette même étendue considérée comme le sujet des

[12] *D*, p. 23.

> modes qui constituent la forme de la cire, est ce qu'on appelle *Matiere premiere*. D'ou il s'ensuite que le mot de Corps est un terme absolu, & que les mots de quantité & de matiere premiere ne sont que des termes respectifs.

If we make this distinction we shall avoid the error of taking quantity and primary matter as absolute things existing really outside of the understanding. Régis thinks that his definition of primary matter is Aristotle's, with the addition (which Aristotle forgot to make) that primary matter is "extension itself considered as the immediate subject of the modes in which the primary forms of purely material beings consist". With Aristotle we may say that primary matter is not a determinate thing. Every body consists at bottom of primary matter and is resolvable into it. Thus, for Régis, Descartes has supplied a content for the Aristotelian term. But this leaves Cartesian doctrine with the problem of supplying an equivalent for the Aristotelian form "par quoy plusieurs choses different les unes les autres". Against the scholastics, however, Régis asserts that we must deny that the material forms are substances or substantial. Now, he thinks, upon the basis of Cartesian doctrine, material forms are either 'geometrical' or 'physical'. God, we must posit, having created extended substance or primary matter, has divided it into an infinity of parts of one or another figure; and, secondly, has done so in such a way that there exist voids between the parts; finally, the 'division' that He has placed between the parts consists in the diversity of movements with which they were endowed upon the instant of their creation. With this set of conceptions and distinctions, Régis is prepared to introduce the theory of the *tourbillons*. Both for him and for Cordemoy the fundamental difficulty for physics upon the Cartesian basis was to make provision for the specific differences of particular things in connexion with their reduction to one substance the essence of which is extension. And this question becomes acute precisely because the perceptual qualities of things must be included within the realm of spiritual substance, and can no longer serve as the means of differentiating one thing from another. The *Éclaircissement* of Physics by the discrimination of soul from body is not accom-

plished without raising new problems, or at least without necessitating a reformulation of the old.[13]

The second Discourse is devoted to the thesis that all changes whatever in matter can be explained by local movement, even changes of quantity (*accroissement ou décroissement*), of quality (alterations), and of form (generation and corruption). What changes of quantity, quality, etc., really mark are not differences in the nature of movements, but diversity in the degree of motion, and so in its sensible effects. Motions do not differ qualitatively —and here Cordemoy is rejecting qualitative physics—but in amount. He is cognizant of the mechanical schema of interpretation and of its significance. The rules of mechanics obtain not only in the parts of matter that we can see but also in those that we cannot.

Cordemoy's common denominators for the physical world are therefore extended substances or bodies, figure, and local motion. Given these, and the intervals (or pores) existing between the bodies forming material things, all that is needed for a universal science of nature is given. In this way he envisages that science which Descartes had taught him to perceive. It remains for him to remove from a special branch of physics, the study of the human body, the inconsistencies and ambiguities that had marked Descartes' treatment of the matter.

III

Only spirits can be sensitive (*sensibles*) as only bodies can be moved, says Cordemoy. Beasts are bodies and nothing more. The body of the beast and that of man fall within the province of physics. Cordemoy adapts the conception of animal spirits to the needs of the case. The nerves are "des suites & des alongements du cerveau mesme".[14] They are conceived to be like tubes, and are sometimes full and sometimes empty of spirits. He follows Descartes in asserting that the most subtle and warmest parts of the blood mount from the heart to the brain. Into additional details concerning his account of the body we need not go. We

[13] *Système de phil.*, etc., Paris, 1690, T. I, Livre premier de la physique, Partie I, ch. 2, pp. 283–5; Livre second, Partie II, chs. 1, 2, 3. 4.

[14] *Traité de Mét.*, in *O*, p. 106.

may be content with noting that he extends the conception of subtle matter as operative principle beyond the body. Subtle matter is the cause of all movements, whether of masses or of 'sensible liquors'. In its pure unmixed form it is the cause of light. The cause of the motions of artificial and natural machines is one and the same—it is subtle matter.

The mechanical conception of bodily activity, as well as the form taken by the body-mind problem for Cordemoy, are interestingly illustrated by his theory concerning words. On the part of man, he asserts, the means of knowing other men is the word. Souls, indeed, could communicate much more readily were they not united to the body. This union is what necessitates the employment of signs. The failure of minds to understand other minds, it follows, is due to difficulties, not in conceiving the thought which others express in signs, but in the signs themselves.[15]

Beasts, since they are bodies and not bodies plus souls, cannot possess language in the sense in which men have it. Throughout the discussion Cordemoy holds in mind the thought that words or language involve the existence of both body and soul. We must not attribute to other bodies the possession of souls unless we find acts of those bodies that cannot be explained by the body alone as cause. The extreme unlikeness of character that distinguishes symbols and thoughts shows the difference between body and soul, and at the same time indicates the secret of their union. Two elements must be distinguished in the word: that which comes from the body and that which comes from the soul. Now in so far as expressive acts can be explained mechanically (at bottom, by means of the animal spirits), we need not suppose a soul involved in the use of signs. Cordemoy concludes that the cries and vocalizations of beasts can be explained mechanically, without an appeal to a soul. Now he recognizes that, if these cries and other expressive acts of beasts be not words at all, in the sense in which they convey meaning and imply a soul, then we must face the fact that these activities nevertheless serve as a means of communication. How is this to be explained?

The basis of explanation is his general conception that God has

[15] *Un discours physique sur la parole*, in *O*, preface, and pp. 1–2, 36–7, 60–1.

established a certain proportion, *i.e.* a harmony, between our human bodies and the other bodies of the universe. The same would apply to beasts. Thus the cries of animals attract those of the same species and repel those of others. The explanation of this lies in the varying structure of animals. The responses of beasts to sounds, and the vocalization of beasts, are to be explained by wise adjustments of the bodily mechanisms of the various species; and these adjustments are the provision of the Creator. Thus the 'word' in the animal is purely a case of mechanics. But in man it reflects the endowment of a soul. The word in man signifies not merely mechanical adjustment and action, but also that there is perception and the experience of willing for or against the movement excited in the human body by the sound-stimulus. A perception is a thought, and so belongs to the soul.[16]

Cordemoy, be it noted, has no intention of compromising his position that there is nothing common to body and soul save the fact that both exist. The Cartesian appeal to the pineal gland has no attractions for him. Man, for him as for Descartes, is somehow one being. But he perceives clearly enough that Descartes had made him incurably dual. Moreover, if we remain faithful to Cartesian principles, no common denominator can be found for the spiritual and the mechanical fact. How seriously Cordemoy takes this is neatly illustrated by his answer to the question how one may possess a better understanding than another. Does this difference pertain to the soul? Cordemoy perceives that, if we study men as bodily machines, we cannot escape the conviction that one of these machines may be better constructed than another. One human body may possess better vision, for example, than another. How can we resist the logical temptation of reducing the differences of intellectual power to differences in the construction of the bodily machines? But if this be done, shall we not in effect dispense with the need of souls? If the differences can be explained in terms of machine-construction, why cannot mind as a whole be explained in terms of the body? In short, if mechanism explains anything, why will it not explain everything? Now Cordemoy asserts that souls are in principle universally the same. (Here is the Cartesian dictum

[16] *Ib.*, pp. 50–1.

concerning the universality of common sense taken seriously—and without the irony!) Yet he also asserts that differences in power of conception, of clarity of thought, etc., are due to differences in brain-construction. If men of 'slow understanding', he says, were disembarrassed of an inadequate brain-equipment, their slowness of comprehension would cease.[17]

His escape from this difficulty is by means of a first step towards Occasionalism. Finding neither in nature as mechanism nor in man as spirit an explanation of the union of the two in the human being, appeal is made to God. God effects a union of antithetical things. The Author of nature joins movements and thoughts as man artificially joins thoughts and signs.[18] The soul's rapidity or slowness of comprehension depends upon the brain with which it is in union, for brain-activity and thought must correspond one to the other. The Cartesian dictum that good sense is universal in mankind is by no means an innocuous statement. Taken together with the definition of mind or soul as in essence thought, the essential and thorough-going rationality of every mind is in principle implied. As this makes the problem of error grave, just so it raises the problem of the differences of intellectual ability between individual men. The essential rationality of mankind, the fact that thought defines the very essence of each individual soul-substance, does not facilitate an hypothesis concerning the capacity for clear and distinct ideas varying in degree from man to man. When all things lose their qualitative differences of rank, and are reduced to mere quantitative differences in extension, then in an analogous way selves and minds, which are equally spiritual substances the essence of which is the capacity for rational thought, tend to assume equality. This is the germinal situation from which came the faith of the enlightenment that when the obstacles to the free exercise of mental powers shall have been removed, men will quickly attain, as individuals and as forming societies, the rational and the good life. In so far as the immediate followers of Descartes were reluctant to deny the essential equality of human souls, the inequality of bodily machines served as a way of escape. This is a natural suggestion

[17] *Ib.*, pp. 60–1.
[18] *Ib.*, pp. 15–6.

because it is relatively easy to ascribe differences in the powers of imagination, perception, and memory, to the body. But since these faculties are really in the soul, along with the principle of clear and distinct ideas itself, the thought presents itself that either the body explains all differences of capacity from man to man or else it explains none. Thus slowness of understanding, for Cordemoy, is the fault of the body and not of the soul in itself.

In this statement of the situation I have perhaps made the alternatives and issues clearer than they were in the mind of Cordemoy. With respect to this one comment may be ventured. The choice of the one alternative, *i.e.* that responsibility for the apparent inequality of minds rests upon the inequalities of their adjoined bodies, is not without its dangers in view of the general framework of ideas. The point of view is apt to raise a question concerning God's providential designs. For, it may be asked, why should the Creator have inflicted upon one soul the handicap of a relatively imperfect bodily machine, and given another a much more perfect one?[19]

Whether Cordemoy's doctrine is a complete Occasionalism—whether it deserves the name or not—is not a question that need detain us. The interesting matter is not what his doctrine shall be called, but how it came about that this sort of answer was advanced at all. There is an appearance of artificiality in all Occasionalism. Taking the antithesis of body and soul seriously, and combining with this all the evidence that indicates that man is one being, mind reaches an *impasse*. There is no way out save by invoking the deity as the efficient cause of the union of body and soul (or of their apparent union).

However, when we seek to comprehend the genesis of this doctrine, we are driven far beyond such a simple statement. We shall be compelled, indeed, to see in doctrines of this type a revision of the traditional conception of Design. The impact of the new scientific ideas, revealing nature as one system, with all things as instances of extension, and motion as the principle of explanation of every happening within the system, would seem to have brought about a sharp opposition between a world of Design and a world of mechanical action. To whatever extent this

[19] *Cf.*, note 20 below, and the text in Sect. V.

opposition may have been perceived, and so generated an enmity towards the new science of nature, the antagonism and enmity did not prevent the development of quite a contrary point of view. For mechanical explanation could be subordinated to explanation by Design on the condition that Design was restricted to the world as a whole while mechanical explanation was left as the (human) view of its details. Mechanical action, in short, could be envisaged as the divinely ordained means for carrying out the plan of deity for the universe as a whole.

For Cordemoy the unification of body and soul in man, despite their antithesis, is possible precisely because mechanical principles of explanation give a specific content to the notion of divine design. Mechanism provides a clear insight into the very process by which the deity accomplishes his purposes. Certainly mechanical operation is easier to comprehend than miracle. The mechanical arrangement of the universe, that is, the mechanical design of the whole of nature, implies the harmonious articulation of its various parts. The proportion that God has established between our bodies and the remainder of the universe is only a special instance of a general proportion obtaining throughout the universe of created beings. The notion of a deity who more or less arbitrarily and unexpectedly intervenes in the course of events, or affords a special manifestation of his power in famine or pestilence, in miracle, in signs and portents, was certainly familiar enough to the world. That God should intervene was no new thought. To systematize that intervention, to make it orderly (and thus to conjoin even this thought with the spirit of the scientific movement), and to purify both this notion of intervention and the concept of Design from the grossness of tradition,—to do all this was both incidental to the development of Occasionalism and that which suggested the doctrine.[20]

[20] There is interesting corroboration of the spirit of this position in the *Lettre écrite au R. P. Cossart, de la compagnie de Jésus, pour montrer que tout ce que M. Descartes a écrit du système du Monde, & de l'âme des Bêtes, semble être tiré du premier chapitre de la Genèse,* (5 *Novembre* 1667), in *O.* Descartes, says Cordemoy, goes into details. But obviously his teaching is only a more extended explication of what Moses says in Genesis. Descartes' principles are simply a philosophical and exact way of explaining the same marvels that Moses describes historically. We might add the statement that originally, before the Fall, man's body and soul were in complete harmony with the whole

One other point must be considered. Cordemoy's physical doctrine is essentially an atomism. Body—*corps*—is the indivisible unit of composition of matter. Between bodies are pores or intervals, whatever these are. Bodies are extended substances, each terminated in its extension, *i.e.* each possessing specific figure. The separation of soul from bodily machine is really but one instance of a division prevailing throughout nature. There is as much need of an explanation for the conjoint behavior of the units of physical nature as for that of body and soul. The explanation of the latter through the activity of the deity both illustrates and suggests the activity of the deity throughout the universe. In this direction lies the completion of the doctrine in Occasionalism.

IV

We may turn to the question of the first cause of motion. That this should be the title of the Fourth Discourse is in itself significant—its very place suggests that it is the more general question which must precede the more limited body-soul problem. Adopting in this discussion the geometric method, Cordemoy lays down two axioms:

1. On n'a pas de soy, ce qu'on peut perdre, sans cesser d'estre ce qu'on est.
2. On ne peut conçevoir que deux sortes de substances, sçavoir *l'esprit* (ou, ce qui pense) & le corps: C'est pourquoy on les doit considérer comme les causes de tout ce qui arrive; & ce qui ne peut venir de l'une, se doit nécessairement attribuer à l'autre.

From this it follows that the first mover of body is not body; it can be only a spirit, and, moreover, only the spirit that commences motion can continue to move bodies.[21] The point is that

of the universe. The Fall brought a disturbance of the whole proportion. (*Traité de Mét.*, *O*. The letter is referred to by Daniel, *op. cit.*, p. 5.) In *De la nécessité de l'Histoire*, etc. (*O*), Cordemoy suggests the use of History for the education of young princes. History should commence with Genesis, and a wise instructor can use philosophy and theology, without being burdened by syllogisms, to explain Creation and the Order of the Universe, and to give a high idea of the power and wisdom of God.

[21] *D*, pp. 94–7. *Cf.* also the *Traité de Met.* in *O*, to the effect that God is the cause of corporeal and spiritual substances, and that the one is capable of being extended and the other of thought and will; but God is not extended and is not body. Pp. 111–2.

the unitary body-substance, Cordemoy's atom, cannot cause a motion. For, if it did, it would lose something of itself and so in that measure cease to be. But the atomic bodies are fixed in their being. Their motions cannot come from anything extended, or from anything material. Matter is a composite of bodies. The phenomena of motion, accordingly, demand a non-material cause, not merely for their beginnings but for their continuation. In these statements Cordemony is asserting the insufficiency of the mechanical conceptions of science. All relations in the physical world are cases of motion. But none of them is intelligible in terms of the entities of which that world is composed.

From this it follows that God's intervention is continual. We say that an object B causes C to move, and C causes D to move, and so on. But since no body can transmit anything to another body, God's activity is present in every case of change. The encounter of two bodies is "une occasion à l'esprit, qui a meu les premiers, de mouvoir les seconds".[22] To think that one body moves another is to confuse occasions and causes.

The motions of our body are then similar to any other motions whatever. Our will is not the cause of them. Cordemoy refers to reflex action to demonstrate that our body moves before we will it to move.[23] The soul can be said to move the body only in the sense that one body moves another—a statement which reveals how for him the relation between body and soul is but one instance of the general problem of relations.

As the laws expressing the orderly relations between things (or between the constituent bodies) are laws established by the deity, so the relations of the body and soul are instituted by God. The power of the First Spirit "a aussi posé entre nos ames & nos corps des loix qu'elle [*i.e.* this spirit] ne voile jamais; & tandis que ces corps sont constituez d'une certaine façon, elle en dirige toûjours certains mouvemens selon nos desirs, ce qu'elle fait avec tant de promptitude, & se conformement a nos volontez . . ."[24] that we believe we ourselves to be the cause.

[22] *D*, p. 104.

[23] Reference is made also to the fact that vital movements cease despite the will; moreover, we cannot control the speed of the movements of the subtle kind which cause bodily motion. *D*, pp. 105–6.

[24] *D*, pp. 117–8.

As the unity of the world, consequently, is an order imposed upon its discrete elements, so the unity of body and soul resides in the regularization of the activities of the other. The union of body and soul cannot be similar to the union, in the ordinary sense, of two bodies. Nor can it be analogous to the union of two souls.[25] The relation of body and soul is a special case of organization precisely because the things to be related have nothing in common. The whole meaning of the union of body and soul must be given in a ***harmony***, an *appropriateness*, a *correspondence*, between a state of the soul, an idea or volition, and a state of the body, whether a perception or an action. If the spirit wills a movement of a certain sort, and the body does move conformably, then this *is* (one might say 'phenomenally') the union of body and soul. This doctrine furnishes a certain meaning to the statement that God is everywhere, without being dependent upon matter, and that the soul is wherever there are motions directed by it. The whole of the soul is, in this sense, in the whole of the body.[26]

[25] Cordemoy's conception of union is covered by the following definitions and axiomatic propositions.

Definition I: "Deux corps sont unis autant qu'ils le peuvent estre, quand leurs étendues se touchent mutuellement & avec un tel rapport, que l'un suive nécessairement les déterminations de l'autre. *Definition II:* De mesme, on diroit que deux esprits séroient unis, si leurs pensées se manifestoient mutuellement & avec un tel rapport que l'un suivist nécessairement les déterminations de l'autre. *Axiom:* D'ou il résulte que l'union des choses ne se fait que par ce qu'elles ont du rapportant: Et conséquemment si un Corps & un Esprit sont unis, ce n'est pas par la rapport de deux étendues, car l'Esprit n'en a point. Ny par le rapport de deux pensées, car le Corps n'en a point" (*D*, pp. 120–2). This may be completed by the definitions and axiom of the second part of the Fifth Discourse. "*Def. I:* On dit qu'un corps agit sur un autre, quand à son occasion cét (sic) autre corps commence d'estre arangé ou meu autrement qu'il ne l'estoit auparavant. *Def. II:* De mesme on dit qu'un esprit agit sur un autre esprit, quand à son occasion cét esprit concoit, imagine, veut, ou pense, en quelque façon que ce soit, autrement qu'il ne faisoit auparavant. *Axiom:* D'ou il résulte qu'une chose n'agit sur l'autre qu'autant qu'elle y peut apporter de changement suivant sa nature . . ." Hence a body cannot cause movement in a soul, or a soul cause thought in a body (*D*, pp. 128–9). We are led to the conclusion: "Mais si ce corps, ou son mouvement, ou sa figure, ou autre chose dépendante de sa nature peut estre apperçeu de quelque esprit, en sorte qu'à son occasion cet esprit ait des pensées qu'il n'avoit pas auparavant, on pourra dire que ce corps a agy sur cet esprit, puisqu'il luy a causé tout le changement dont il estoit capable suivant sa nature" (*D*, pp. 129–130).

[26] *D*, pp. 124–5.

In all of this, it will be evident, the Cartesian antithesis of body and soul is accepted. The members of this dualism, however, will bear with unequal weight upon psychological, epistemological, and theological problems. God, it is clear, is as different from matter as is the soul. God and the human soul are together opposed to matter as the spiritual to the material. Moreover, the knower, and the thing that perceives, feels, and imagines, reside in the soul. The Cartesian dualism sets over against the material universe, not man, but man's soul. And while it makes the human soul and God of essentially the same substance, matter remains the antithesis of that substance. The older distinction between the Creator and the created is supplanted by, or, better, cut across by, the distinction between the spiritual and the material. Aforetime, perhaps, the existence of the world was considerably more assured than that of the soul. But for Cordemoy it is necessary to believe, if not to demonstrate, that the existence of the soul is more certain than that of the body, or of body in general. Appropriately enough, this assertion is a portion of the title of the Sixth Discourse.

V

There are some, says Cordemoy, who assert that, were it not for the teaching of religion, there would be grave doubts of the existence of the soul. However, he adds, while the confirmation that faith affords is welcome, yet it is not necessary for the conviction that the soul exists. Indeed, it is astonishing that people should doubt on the subject. Nothing is clearer to the spirit than the spirit itself. One may doubt the existence of the body, but not of the doubt itself. Doubt is a thought and who can believe that a thought is the same thing as that I call a body? Is it asserted that I feel the body? But persons whose fingers have been cut off may feel pain at the ends of the fingers—but they do not imagine they have extended parts that really are lacking. There is no ground for believing in extension if the sole reason for the belief is that I feel it. I may think I have a body without really having it. But I cannot think without really having a thought. In this way Cordemoy removes the Cartesian argument from a logical, methodological, and epistemological, to what is essentially a psychological, context. The soul or mind (*Âme* or *Esprit*) is

"that which thinks of something". But we have seen that all psychological processes, ideation, perception, attention, memory, imagination, judgment, and will, are unequivocally assigned by Cordemoy to the soul. All are *pensées*.[27] Without the soul all is extended substances and motion. Within the soul is my immediate experience, that which I am. That I am aware of extension by feeling—that I sense it—is not certain evidence that such a thing exists. The existence of the soul is *more* assured than that of the body.

What then belongs to me *à cause du Corps?* What belongs to me because of the union of body and soul? To both questions Cordemoy must reply that, in one sense, nothing pertains to me because of the body or because of the union of soul and body. But in another sense body and soul can be understood only in terms of one another. Let us remember that there is a certain proportion between them. This proportion is a part of the deity's universal adjustment of things to one another, an adjustment presumably perfect before the Fall, so far as man is concerned. The order that God imposes, so to speak, upon the relations and motions of the elements of matter is the expression of this adjustment, of this universal harmony. My soul, *i.e.* the realm of spiritual events, is proportioned to my body, the realm of physical events with which my soul is intimately related. What has already been observed of the appanages of the body, says Cordemoy, leads me to know that "si ie remarque de la figure, du mouvement, & des organes differéns en moy, c'est parce que i'ay un Corps".[28] The same thing may be remarked concerning nutrition, the transportation of the body, waking, sleeping, etc.

Something must result from the union of soul and body. Anything that cannot be explained as due either to body or to soul must be due to their union. Cordemoy then employs the conception of animal spirits as the neurological basis for the explanation of the mechanism of sensation and perception. I therefore can possess the senses without being more than a body. All such processes are reducible to brain-motions. The same may be said

[27] The thing I think about is called an object. "Ce que l'on conçoit de l'objet s'appele *idée;* on la nomme *perception* à l'abord, *attention* à la continue; & *mémoire.*"

[28] *D*, p. 152.

of such matters as hunger and thirst. However, to assert that one may possess such processes, and still be body and nothing more, is a statement limited to physiological processes. In other words, Cordemoy here distinguishes between neurological sense-processes and the sensation or perception itself, the end-results of the causal chain, which are psychological facts. "Mais il n'est pas possible . . . que je les sente [*i.e.* the bodily processes] & que je m'en apperçoive, des qu'elles arrivent, sans avoir une Âme, & sans que cette Âme soit unie au corps que je nomme le mien." [29] The terms 'sensation' or 'perception' may thus signify two entirely unlike universes of discourse, that of bodily mechanism and that of spiritual process. Sensing is something utterly different from, although allied with, a stimulus-reaction circuit. Cordemoy illustrates his distinction by giving an account of nerve-process that may be called, quite fairly, sensori-motor, and then adds: "Mais cela n'est pas sentir." [30] On the other hand, were I a soul without attachment to a body, I should not perceive a process resulting from (say) an injury to my finger, and should have no interest in it—and "cela n'est pas sentir la douleur". But "il est certain que si par la puissance qui a fait ce corps & Âme, ils sont en telle disposition, qu'il y ait un rapport nécessaire entre les pensées de l'une & les mouvemens de l'autre, en sorte que cette Âme ait interest que les mouvemens de ce corps soient toujours iustes, & les organes qui y servent, bien ordonnez, elle ne pourra s'apperçevoir de l'état violente & contraire à l'oeconomie de ce Corps qu'avec douleur." [31] Similarly, the soul, taking an interest in everything making for the conservation of the body, perceives the need of alimentation and so feels hunger.

As the above quotations indicate, and as is further shown by Cordemoy's discussion of pleasure and pain, he continues the standpoint broached but not developed by Descartes. The latter's rather incidental statements to the effect that sensations are to be viewed as agencies making for bodily welfare, for the control of the body and its adjustment to the environment, and as signs of the relation of the organism to things, are carried somewhat

[29] *D*, p. 176.
[30] *D*, p. 177.
[31] *D*, p. 178.

further by Cordemoy. Pleasure and pain are to be explained—or rather to be understood—in terms of what is useful and what is harmful to the body. They are the soul's feeling of the equilibrium or inequilibrium of the bodily economy. He adopts the thought of Descartes, that sensation and the passions are due to the fact that man consists of soul and body. With Descartes the idea was connected with the possibilities of interaction through the pineal gland, and at the same time was related to the problem of why man, the rational, is so largely irrational. With Cordemoy, of course, the conception that sensation and the passions are fruits of man's composite nature is altered in the direction demanded by his rejection of every possibility of interaction. In so far as useful, sensation reflects the orderly proportioning of things in the world by God. In so far as sensation and passion indicate inequilibrium, a disordered condition, they represent a failure of that proportion. To account for it, presumably, Cordemoy would appeal to theology, the divine plan, and the Fall.

The sphere of the psychological and the neurological are thus sharply distinguished. The correspondence between them, however, is so exact that the effects of habit obtain in both spheres. Cordemoy seems to think that a process in the body, when the soul is added, involves the additional fact of a feeling in the soul. Then this feeling (say, of pain or hate) leads to a change of disposition in the soul, *i.e.* to an activity of will. This volition is then the occasion of an alteration in the bodily process. Whether this character of sequence involved in the preceding statement is merely incidental to Cordemoy's mode of expression, or represents his real meaning, is difficult to determine. It is clear enough what results. For if once a *pensée* has been joined to a movement of the brain, he says, "jamais l'âme n'a cette pensée, par quelque occasion que ce soit, que ce mouvement ne soit excité de nouveau ".[32] Again, desire is the thought that the soul has of following that which can serve the body, and fear (*crainte*) the thought of avoiding that which may injure the body. Thanks to the principle of habit, the correlations of desire and fear with bodily processes become fixed, and when the one recurs, so will the other.

In all these ways Cordemoy recognizes that the fate of the soul

[32] *D*, p. 194.

is in some sense bound up with the career of the body. The soul is a name, not for a substantialized knowing principle, but for a self with its own life and inner way of being. Yet this soul reflects at every moment its specific attachments to the body. It adds to the bodily process a new datum. The motions of the brain are diverse in correlation with the diversity of objects. And in correspondence with the diversity of brain-perturbations the states of the soul vary. Strictly speaking, the states of the soul are conjoined with the perturbations of the brain. The doctrine that the perturbations of the nerves form the 'occasions' for the formation by the soul of the idea of the object, that is, the perception, was evidently regarded as peculiar to the "Cartesians". Daniel, representing the Jesuit opposition, takes it as characteristic of them. He points out that as a consequence our ideas and perceptions of objects do not depend necessarily upon the objects, "mais uniquement de l'organe interieure".[33] But, explains Cordemoy, the soul does not conjoin the sensation with that "qui la cause immédiatement" ('cause', of course, to be taken in the sense of immediate occasion). Rather, it relates the sensation with the places from which the 'ebranlemens" (*i.e.* the stimuli) customarily proceed. It connects the sensations of pleasure and pain, Cordemoy states in the *Traité,* with its own body, and other sensations with their various objects or causes. That is, the soul "appliquant toujours sa sensation à la chose, pour la perception de laquelle elle luy est donnée, il luy arrive ordinairement de la confondre avec cette chose".[34] It is useful, says Cordemoy, that the brain should be stimulated from a distance by means of subtle bodies, and it is useful that the soul should *rapporter* the sensation occasioned by the motions of the brain to the objects which start the train of motion.[35]

This transference of the sensation to the 'object' is a most interesting illustration of the effects of taking the Cartesian dualism seriously. If the soul and body are utterly unlike, their union is definable only as a correlation or correspondence of a state of the one with a state of the other. Outside the soul are motion, extension, figure, but nothing more whatever. Whatever

[33] *Op. cit.*, p. 58.
[34] *O*, p. 117.
[35] *D*, pp. 212–3.

commerce the soul can possibly have with the extra-organic world is indirect, and that in two senses. It is indirect in that it is limited to a somewhat inexplicable correspondence of events utterly unlike. It is indirect in a second sense, in that this correspondence is really limited to the correlation of a state of the soul with a state of the brain, not with an extra-organic thing or event. The movements of the nervous system are connected by a chain of causes (*i.e.* occasions) with that which lies outside the human body. But the occasions of states of the soul are, so to speak, the termini of these chains of causes, the motions in the brain. We should therefore expect to find the soul transferring its states, its sensations, to the correlated motions of the brain, rather than to the objects from which these motions proceed, as Cordemoy expresses it. At least there is precisely as much reason for the transference of the sensation to the brain-motion, to the terminal portion of the chain, as to any other portion. The soul has no sensation save when certain movements of the brain constitute the occasion. But Cordemoy acknowledges that we never perceive these brain-perturbations.[86] Moreover, it is a question as to the sense in which, on his principles, the soul can perceive any motions at all. But laying that aside, it is clear that he felt the difficulty concerning the very existence of the extra-organic world brought about by his strict adherence to the antithetical character of soul and body. He does not seem to entertain the problem specifically. But he recognizes that the soul does, in fact, conjoin or *rapporter* its sensations to extra-organic rather than to intra-organic occasions; and he recognizes in addition that this is something to be explained. His explanation, so far as it goes, is simply that it is useful for the soul to do this. It is useful, however, only because the soul is wedded to the body, and this transference of the sensation is primarily useful to the body and only indirectly to the soul. We are creatures composed of soul and body. As creations of the Creator we fall within that general proportioning for which the deity is responsible. Because of the orderliness of the world, it is useful for the soul to attach its sensations to the early rather than the later links of the chain of causes, and in this sense guide the body. It can hardly be doubted that Cordemoy feels assured

[86] *D*, pp. 228–9.

of a certain efficacy of the soul. If it learns, the body profits thereby because God will parallel this improved condition of the soul with its appropriate correlate in the organism. In this very indirect sense there is an interaction of soul and body. Cordemoy seems to imply that the soul gradually comes to make the transference of the sensation to the extra-organic object. The hint is not developed, nor is the efficacy of thought by means of God worked out. The background of the matter is the general conception of God's proportioning of things. In asserting that God's instrumentality provides that the soul shall have the state appropriate to the body and the body a condition appropriate to the condition of the soul, Cordemoy defines none too clearly a mode of interaction giving efficacy and concrete meaning to the union of soul and body. He is carried over whatever obstacles such ideas may have presented to him by the notion of God's providence.

For Cordemoy himself, the problems of the nature and efficacy of the soul, of the nature of the body and its "marvellous union" with the soul, are satisfactorily solved. The world of things, the subject-matter of physics, has been stripped of every quality that by an inveterate habit we incorrectly attribute to it. Because we have reached a knowledge of the self, we have attained a clear idea of things. In obtaining a clear idea of the union of the soul with the body we secure a clue to the relations of one thing with another. With all this the soul achieves a vision of its true worth.

> Elle renferme en soy tout ce qui la peut satisfaire; & estre dans une joye sans pareille, elle n'a qu'à faire reflexion sur ce qu'elle est; elle n'a qu'à bien examiner les notions parfaites que Dieu luy a données, soit pour se connoistre elle-mesme, soit pour connoistre le Corps qu'elle anime, soit pour connoistre quel est ce merveilleux rapport qui fait toute leur union. . . .

And beyond this lies even more.

> Elle peut par le mesme moyen connoistre (du moins autant qu'il luy est utile) toutes les autres pieces qui composent cét universe; enfin elle peut par ces lumieres connoistre Dieu mesme, & le connoistre assez pour l'aymer plus que toutes choses.[37]

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[37] *D*, preface.

DISCUSSION

THE REVOLT AGAINST DUALISM *

PROFESSOR LOVEJOY'S lectures delivered and published on the Foundation Established in Memory of Paul Carus, Editor of *The Open Court* and *The Monist*, form a worthy successor to *Experience and Nature*, by Professor Dewey. The debt of American philosophy to Mrs. Carus is evidently going to grow as the years go by. It is interesting that these two initial volumes should severally represent the two different but related philosophical tasks of constructive theory and critical survey. In one sense this is only a difference of emphasis: Dewey currently criticized as well as constructed; Lovejoy, at the end, constructs as well as criticizes. But the difference in degree results in a difference in kind.

It is a matter for general congratulation that Lovejoy subscribes to the postulational method in philosophy. He tells us that in his opinion philosophers should discuss their problems "expressly in this form: If certain things (which some philosophers or other men believe) are provisionally taken as true, what other things must be or may be true? A great part of philosophy, in other words, should consist of attempts to determine what sets of propositions, in certain fields of investigation, properly go together" (p. 257); "it is, at all events, this method that has been followed in these lectures" (p. 259).

The particular contentions to which he applies this method are of course indicated by the title of the work, but they are more specifically stated in the Preface. "The principal purpose of this volume is not to present a private and original speculation, but to show, through a critical survey of the reflection of the greater part of a generation of philosophers in America and Great Britain upon two important philosophical issues, that certain conclusions with respect to those issues have thereby been definitely established." These philosophers have made, each in his own way, "the attempt to escape from that double dualism which the seventeenth-century philosophers did not, indeed, originate, but to which they gave reasoned and methodical expression—the epistemological dualism of the theory of representative

* *The Revolt against Dualism: An Inquiry Concerning the Existence of Ideas.* By Arthur O. Lovejoy, Professor of Philosophy in the Johns Hopkins University. The Open Court Publishing Company, W. W. Norton & Company, Inc. [1930.]

perception, and the psychophysical dualism which conceives empirical reality to fall asunder into a world of mind and a world of matter mutually exclusive and utterly antithetic" (pp. 2–3). The former dualism is more fully defined as the supposition "that all apprehension of objective reality is mediated through subjective existents, that 'ideas' forever interpose themselves between the knower and the objects which he would know" (p. 3). "Against both dualisms . . . our age has witnessed an assault . . . bolder, more sustained, more resourceful, and upon a wider front, than can be found anywhere in the previous history of philosophy" (p. 3).

This revolt he divides into two phases and two single-handed campaigns. The protagonists of the first phase are G. E. Moore, William James, "the new realists", John Dewey, Knight Dunlap, Samuel Alexander, Dawes Hicks, John Laird and Bertrand Russell—all, of course, as represented in their earlier writings. These rebels are disposed of in less than forty-five pages (pp. 34–78). In the second phase we have such persons as Dewey (again), A. E. Murphy, M. C. Swabey, S. P. Lamprecht, Kemp Smith (again), G. H. Mead, Donald Piatt, and E. A. Burtt. More than seventy-five pages (pp. 79–155) are required for dispatching this band. The suppression of A. N. Whitehead's revolt—with his "denial of simple location"—calls for something like thirty-five pages (pp. 156–189). Russell—with his "unification of mind and matter"—was apparently a more stubborn (or more important?) adversary, for he is not subdued until he has been exposed to the bombardment of more than sixty-five pages (pp. 190–256). When the smoke of battle has cleared away, the double standard of dualism is unfurled and triumphantly floats through the remaining pages of the book, including the Index (pp. 257–321, 323–325). The positions won are consolidated against idealism, the sole remaining enemy.

It is of course impossible in any discussion to do justice to Lovejoy's claim of victory over all these rebels. Several careful readings of his book lead me to estimate (roughly) that he has won about fifty per cent of the bouts. Where he wins he usually wins decisively, as is to be expected from so skilful a dialectician. It would be hard to find a book in which the tasks facing the epistemologist are more clearly or more forcibly stated, although even here one cannot but think that sometimes the statement is prejudiced by the conclusions at which Lovejoy finally arrives. He rightly insists on the necessity, in framing a theory of knowledge, of keeping always in mind what we know and the fact that there is much we do not know. Any

successful theory of knowledge must fit in with achieved knowledge as well as with acknowledged ignorance; and if it is to be quickly and widely accepted it must interpret these facts as they are ordinarily interpreted. But this ordinary interpretation is not always the necessary, or necessarily the correct, interpretation. Arguing from this ordinary interpretation Lovejoy's logic is powerful and his presentation vivid. It would be a gracious task if I could confine myself here to reviewing the many contentions with which I find myself in agreement; but the space allotted, even by a generous editor, is not adequate to a complete discussion of such an important book.

The great value of the book, I suspect, will ultimately be found to consist not in the "conclusions" it has "definitely established", but in the reactions that those attacked will make to its criticisms. The likelihood is that the war has just begun instead of being definitely closed. What Lovejoy evidently regards as dry bones left on the fields of battle may turn out still to have sinews and flesh upon them and to be covered with skin, and his prophecy may have been unto the wind. We shall in time see whether they do not stand up, an exceeding great army. All the men done for in the book are at least biologically if not philosophically alive, and each will probably have something to say for himself in the spirit of Mark Twain's remark about the report of his death. For this reason I may follow my own inclination and select such arguments of the book as are provocatively interesting to me. For I feel like the Irishman who, seeing a fight, took off his coat, rolled up his sleeves, and asked whether it was a private fight, or whether anybody might get in.

But before I get in, there is a preliminary logical matter that needs attention. Between the view that "*all* apprehension of objective reality is mediated through subjective existents" (my italics), and the view that *no* apprehension of reality is thus mediated, there is a large gap. It may be that *some* apprehension *is* and *some* apprehension *is not* thus mediated. Once in a while Lovejoy recognizes this possibility, as on page 148, where he says: "What dualism has affirmed is (a) that there is a certain class of things, namely, physical things, which exist without dependence upon a specific kind of relation to a specific kind of events, namely, brain-events accompanied by perception or other modes of awareness; and (b) that there are certain other things, namely, all (*or, in a restricted form of the doctrine, most*) immediate perceptual and other data, which exist only by virtue of that kind of relation to that kind of events" (my italics). If a "restricted" dualism is possible, is not this also a "restricted"

monism? The arguments in Lovejoy's book that seem to be conclusive are those directed against the unrestricted form of monism, which attempts to put into the physical world such things as the hallucinatory objects of the drunken and the insane. Without doubt he scores against this type of monism when he says: "The only possibly significant consequence which could be deduced—though it apparently was not—from the thesis of the objectivity of all content was an affirmation of the metaphysical uses of inebriety" (p. 76).

When it comes to arguments that if valid at all are valid even against the restricted form of monism (or of dualism if you please), we have a different situation. In studying this situation may we not make in favor of this monism the distinction that Lovejoy makes in favor of his unrestricted dualism? He justifiably distinguishes between the "unnecessary aberrations of the early and long-accepted forms of dualism in modern philosophy" (p. 6), and "the dualistic position more discriminatingly" defined and reduced "to its simple essentials, without the accidental redundancies of its seventeenth-century and traditional expression" (p. 10). It seems to have taken nearly three hundred years for this dualism to get simplified by returning from its aberrations into its proper path. "Objective relativism" has been muddling along for not so many decades. May not many of the steps it has taken prove to be temporary aberrations also? If so, Lovejoy has done a service in exposing them as such, but this service does not necessarily result in the establishment of the unrestricted form of dualism. What must be done is to show that no form of objective relativism is tenable. That is a pretty big job, which it is possible that Lovejoy has not accomplished, his opinion to the contrary notwithstanding. History has a way of presenting unsuspected alternatives generically related to demolished views, and another two hundred years may give us an objective relativism recalled from all aberrations, partly by Lovejoy's criticisms, and yet in its essentials unscathed thereby. There is greater reason for this hope in that many of his attacks do not have the logical force he serenely attributes to them. Perhaps there is in his book no more carefully (yes, even meticulously) elaborated criticism than that directed against objective relativism on the score of its unwarranted exploitation of the ambiguous word 'relativity'. And yet it would seem that after much ado he only succeeds in showing that a logical critic can excel in fallacies.

It is this criticism that shall exclusively occupy our attention in the rest of this discussion. It is a fair sample of much of the book.

Lovejoy distinguishes three different meanings of 'relativity', namely, "conditionality", "perspectivity", and "respectivity" (pp. 90 ff. and Chapter IV *passim*). "One of the things most to be desired—though doubtless hardly to be expected—in the discussion not only of the philosophical doctrine we are now considering, but also of the physical theory of relativity, is the discontinuance of the use of this ambiguous word [relativity], and the substitution in each case of one or another of the expressions 'caused' or 'conditioned by', 'respective to', or 'appearing from the standpoint of'" (p. 141).

1. Of "conditionality" he says: "As applied to the case of perception, it consists in the dependence of the existence of a character, or set of characters, actually given in experience, upon the existence or occurrence of something else" (p. 90). Nothing in this initial passage, in which a definition of conditionality seems called for, is said about the limitation of the "dependence" in question to *causal* dependence, and to just one consequence of causal dependence. And yet when Lovejoy begins to unravel the tangle in which the objective relativist is involved by reason of a failure to distinguish conditionality from the other meanings of relativity, he proceeds without so much as by-your-leave to treat a conditional quality as an *effect*, and *therefore* as not a quality of something prior to the "proximate cause". The inadmissibility of equating conditionedness with causedness is seen when we remember that in mathematics the value of a function is conditioned by the value of the independent variable, but this conditionality is not, except in certain applications, a causal one. If the reply is that, in distinguishing between the three uses of the word 'relativity' by the objective or by the physical relativists, non-causal conditionality was not discovered in their employment of this term, it is to be expected that some relativists will say truly that Lovejoy has therein failed to understand their position. At any rate, he assumes that the objective relativist regards all perceived characters as causally conditioned by the percipient event (whether physiological or conscious).

Let us for the sake of argument assume it likewise. What follows? Lovejoy thinks it follows that such conditioned characters cannot be characters of what in time preceded the condition. Let us see. There is such a character as that of 'being an ancestor of a president of the United States'. Had Mr. Hoover not been elected president in 1928 an indefinitely large number of men and women of bygone days would not have acquired this character. If being conditioned by an event is the same as being caused by it, his election can be said to have

caused them to become presidential ancestors. Here then is a conditioned character that is indubitably a character of what in time preceded the "proximate" condition, *viz.*, the election of President Hoover. Even if this is not the kind of conditionality that Lovejoy had in mind, is it not the kind that some objective relativists had in mind? If the latter, then Lovejoy's nice little logical sequence, starting from the conditionality (conceded by the objective relativists) of perceived characters, and going through their consequential "existential subjectivity" to their "non-physicality", is either a *petitio* or an *ignoratio*. Which does he prefer? Perhaps it is both!

Since there unquestionably are some conditioned characters that are properly attributed retrospectively to temporal antecedents of their conditions, why in the name of logic may not objective relativists "maintain . . . that the [perceived] character [conditioned by the percipient event] does not 'belong to' the proximate relatum [the percipient event], or is not situated where that term is, but is an attribute, or occupies the position, of the ulterior relatum" (p. 91), *i.e.* of the physical object that initiated the series of physical conditions that ended in the perception? The answer that he gives will be considered in due time, when we come to "perspectivity", "respectivity" and "simultaneity". Meanwhile, as a matter of fact, we *seem* to experience many sense-characters as belonging to objects at a distance from us, objects that we have reason to believe started causal chains that have ended in the perceptions of those characters. If there is no logical reason for not attributing such characters to such objects, the burden of proof rests on the man who says that we may not do it. We shall later see (pp. 253 ff., 257 ff., and 263 ff. below) how efficiently that burden is taken up and carried.

2. The second meaning Lovejoy finds in the ambiguous term 'relativity' is "perspectivity". The objective relativist regards a percipient event as a "standpoint", and asserts, so Lovejoy says, "that the [perceived] character 'belongs to' the ulterior relatum [the physical object alleged to be perceived] . . . only *from* this standpoint". Now this proposition "seems . . . chiefly, to be intended to assert the necessary *qualitative* disparity of the content present to different percipients, even when they are said to be dealing with a common object" (p. 91). Why "only", and especially why "necessary"? The "elliptical shape of the penny" used (p. 92) as an instance of perspectivity is, even in Lovejoy's meaning of the word 'shape', common to an infinity of standpoints without variation of the "ellipticity", and to four standpoints if both 'shape' and size are con-

sidered; and past experience, interpreted by the theory of perspectives, enables an intelligent percipient to infer the different "ellipticities" that a penny has from any other standpoint not included within this infinity. Hence "what" (Lovejoy says and I italicize) "*now concerns us*" does *not* concern us at all, *viz.*, "that, if a datum, whatever its supposed situation, is *only* a perspective appearance, if it is what it is *solely* from the standpoint of the percipient and *only* for him, and, in the last analysis, *only* by virtue of his individual constitution, then his experiencing of it would not appear to afford what is commonly understood by knowledge" (p. 121); for "in the doctrine of the universal perspectivity of data—if consistently carried out—any reality as it is apart from the special circumstances under which it is perceived or thought of becomes completely unknowable" (p. 123). But in a later passage, speaking of perspective aspects, he says: "It is true that an observer of A, having some acquaintance with the laws of perspective, will be . . . able to infer the character of B" (p. 173). Which of these two contradictory assertions does he wish to stand by?

As an instance of "a general deliquescence of the notion of factual truth and falsity" (p. 123) involved in this doctrine of the perspectivity of qualities, Lovejoy quotes two passages, one from Piatt and one from Burtt, in which it is applied to time. Much that is expressed in these passages I find no more acceptable than he does, but what he finds most revolting I welcome as unquestionable, *viz.* the perspectivity of *pastness*. He insists: "For pastness, as has more than once been remarked in these lectures, is the primary and most indubitable mode of the non-relativity of fact both to the cognitive event and to the vehicles through which facts get reported; and retrospection exhibits the transcendent reference of the data of knowledge in its clearest and most obvious form. The irrecoverable and irremediable past has always been the arch-example of independence, in the epistemological as in other senses, an example upon which countless proverbs and apophthegms and passages of reflective poetry have dwelt. But it, too—even the very pastness of it—is now made dependent upon present standpoints which nevertheless are conceived to be themselves forever changing and forever lapsing into the past. In this kind of relativism the last vestige of sense disappears along with the last vestige of objectivity, and the *reductio ad absurdum* of the 'doctrine of perspectives' becomes complete" (p. 125).

Without question there is a *reductio* somewhere hereabouts, but who is the victim? Is any event, just in its intrinsic nature, past? Is the pastness of an event a "*character which it has irrespective of all*

external standpoints" (p. 128)? If so, the pastness of the stock-exchange débâcle in the autumn of 1929 was a pastness to which those who were furiously speculating in the preceding summer were curiously and unhappily blind; and the death of every person who has ever lived and has already died was past while he was alive. Lovejoy's own words, characterizing the views of some opponents—"a peculiarly complicated, confused, messy, and improbable picture of the constitution of nature" (p. 106)—would come far short of doing justice to such a situation. Of course, from the point of view of any *present*, *its* past is "irrecoverable and irremediable", and those "countless proverbs" and other literary masterpieces are justified in dwelling on this *retrospective* irreparableness. (Retrospectivity is a particular kind of perspectivity.) It would be interesting to have Lovejoy interpret any of these "wistful" passages in any but a perspective sense. *If* pastness "is the primary and most indubitable mode of the non-relativity of fact both to the cognitive event and to the vehicles through which facts get reported", *a fortiori* there are *no* modes of such non-relativity!

But let us turn from this impossible concept of time to the penny and its elliptical shape. The penny is the classic example that with fatal inevitability has always been used to prove that seen things are not what they seem. Now everybody knows that the penny is 'round' and not elliptical nor rectangular. Since this is a matter of common knowledge and common sense, 'round' and "round only" can the penny be! It was a stroke of genius on the part of the first epistemological dualist who chose "the round penny" to prove his point. (If he had written in the time of Homer his instinct would undoubtedly have prompted him to select "the wine-dark sea" to prove that the sea could have no other color.) But let us change the example. Take a human head—not a 'round' one—what is its shape? the profile, the full face, the reverse, or perhaps the top? A sphere is the only thing that has the same shape from all ordinary points of view, and fortunately not many of our heads are quite as spherical as the penny is 'round'. Now what *is* the shape of any human head picked out at random? Is it not a complex of an infinity of contours, from which some three or four are conventionally selected for purposes of description? If Lovejoy were to endow his Demiurgus (p. 320) with the power of creating an animal (or a spirit) who could see 'the real shape' of that human head, how would he—either Lovejoy or the Demiurgus—set about the task? Does the shape of a penny offer a different problem from that of the shape of a human head, except that

of course the penny is 'round'? Has a penny, "independently of the knowing and within its own limits" (p. 132), various contours, or only one contour, or peradventure no contour?

Perhaps what is meant is not the shape of a *physical penny* but the shape of a *mathematical circle*. In Euclidean geometry this figure has at all events the shape its definition gives it, and any other shape that it 'appears' to have is foisted on it by some percipient! But what *is* the defined shape of a circle? In the first place a circle "within its own limits" is a 'plane' figure, and is thus defined by relation to the plane in which it lies, which plane is not entirely within the limits of the circle. Secondly, it is defined by the 'equidistance' of all the points of its circumference from its center; this is a metric character and involves relation to a rigid measuring rod or to some other rigid instrument such as a compass. (The rigidity of such an instrument cannot be defined without reference to something else than the circle "within its own limits".) Thus the defining characters of a circle are characters it has "within its own limits" *only in relation to* something *without* those limits.

In a footnote Lovejoy mentions and dismisses the distinction Broad makes between "sensible form" and "geometrical shape", for the reason that he is "unable to conceive how an area can be sensibly circular without also being geometrically circular" (p. 141). Accepting Broad's definition of sensible circularity, Lovejoy's inability is as difficult for me to understand as Broad's position is for Lovejoy. Broad makes it clear that by "circular sensible form" he means the *qualitative* spatial character one sees when one looks "straight down" upon a circle (*The Mind and its Place in Nature*, p. 172). There surely *is* such a character. Perhaps Lovejoy means that this character is not a character of the mathematical area, since pure mathematics has nothing to do with sensible characters. If so, one must agree. But why call this character 'circular', when it is also seen on looking down obliquely upon an *ellipse* from any point on either of two easily defined lines? If the reason is convenience, well and good; but there is danger that the name 'circular' may lead one to suppose that this form belongs by some proprietary right to a circle, which is deprived of this right when one sees it otherwise, and which is the victim of infringement when an ellipse assumes this form. To correlate what we see with what mathematics defines as circular, it would be better to define 'sensible circularity' as 'the spatial form one sees *when* one sees *that* a figure is circular'. Now one can see that a figure is circular (within the limits of accuracy of vision) just as well when one

looks down obliquely upon it as when one looks down normally upon it. (And both ways involve a third dimension.) All that is necessary is to put the points of a compass, one on the center and the other on the circumference, and rotate the compass about the former point, taking care that both remain in the plane of the circle. On the assumption of accuracy of vision and rigidity of compass, no ellipse *in that plane* would by this test look like any circle in that plane. With this definition of 'sensible circularity' Lovejoy would be justified in denying that an area can be sensibly circular without also being geometrically circular. In fact to say that a circle ever looks like an ellipse is to make an elliptical statement. One should say that a circle in one plane looks like an ellipse in some other plane. To make a long story short, Euclidean projective geometry (with its corollary, the theory of perspectives) is as much an accurate account of projected figures in Euclidean space as is Euclidean metrical geometry.

Before leaving for a time the subject of space, it is necessary to consider the physical "dislocations" upon which Lovejoy lays emphasis as fatal to epistemological monism.[1] What I refer to is what we see when light from a seen object is reflected or refracted between object and eye (pp. 71, 75, *et passim*). Here the objective relativist, if he is wise, will insist that he does not claim to see physical objects 'where they are' *in the receptacular space* that Lovejoy seemingly would provide him with, or at least from which Lovejoy criticizes him. The relativist's demiurge, if he may have one, did not first make a static space (or even a static space-time), and then create objects (or events) which were made to 'take place' therein, and which thereupon began to enter into transactions with each other, from their several points of vantage giving way and making give way. In the objective relativist's physical world spatial directions are not directions *in* which objects *lie*, but *from* which objects *act* and *to* which[2] objects *react*. To speak technically, physical directions are *physically vectorial*. The direction of process *A* from process *B*, which reacts to *A*, is the direction *from* which *B receives* the impulse from *A*. If the sun were moving (or the earth rotating) in a static Euclidean space, the static direction of the center of the sun from any spot on the earth would be the Euclidean straight line from that spot to the sun's center; for instance, an observer would, because of re-

[1] Zöllner's lines can easily be dealt with by the epistemological monist of the "restricted" type.

[2] The very awkardness of the expression 'to a direction' shows that the native idiom, like that of the dualist, is partial to a static space, although it tolerates '*from* a direction'.

fraction, see the sun just above the horizon when in fact it was below. What he saw, because of where he saw it, could not be the physical sun, which happened to be elsewhere. Lovejoy would be correct in his vivid picture of the topsy-turvydom thus introduced by the epistemological monist into physics in connexion with such dislocations (p. 76 *et passim*). But since the objective relativist's physical space is not (or at least need not be) a "box without sides", but a system of dynamic directions and distances, the man who sees the sun in the direction from which it acts upon him sees it in its physical direction from him. (A tautology is sometimes necessary against one who denies the truth it expresses.)

Even in the ordinary affairs of life we use the word 'direction' with respect to the practical conditions under which we operate. A traveller, dismounting from a train at a crossroads in a mountainous region, asks a native the direction to Inspiration Point, farther up the mountains. What he wants is the *road*-direction to his destination. It might well be that the road that starts out from him in the direction in which a crow would fly is not the direction that he seeks. An intelligent guide would point out, not the latter direction, but the one relevant to the conditions that gave rise to the question. Now change the conditions: The traveller tells the native that he expects a motoring friend *from* Inspiration Point, and in this connexion asks for the direction from that village. The native would be a knave or a fool who should point out the direction from which any road comes that does not come from that village, even though it might be the direction from which an aviator would come. When in touring we ask for 'directions' we ask for viatic directions; and what is true of touring is true of all dynamic transactions. As Eddington has said, "To put the conclusion rather crudely, space is . . . a lot of distances interlocked".[3] Had he wished to put the matter a little less crudely, he doubtless would have added that it is a lot of *directions* interlocked. The part of space that interlocks the nautical direction from New York to Liverpool with the nautical direction from Liverpool to New York does not lie in an Euclidean straight line. Neither does the sun's *optical* direction from an observer coincide with its Euclidean direction displayed in a planetarium. Lovejoy seems to think of space in terms of a glorified Mercator's map.

The 'straight' stick 'seen bent' in the water illustrates the same principle. The optical (and by optical I mean *physically* optical) directions of the different submerged parts of the stick from the eye

[3] *The Mathematical Theory of Relativity*, p. 10.

of the observer are exactly the directions in which the observer sees these parts; hence the physically optical and the visually optical bentness coincide. One who believes, as Whitehead does, in a *metaphysically absolute* Euclidean space-time (and not merely in a *metrically universal* space-time) naturally would explain the seen bentness of the stick as a projection of sensa into the seen space-time region for the purpose (or at least with the result) of "illustrating" this region. But this seems to be a personal idiosyncrasy. Why not say that the optics of our vision is, so far as it goes, exactly the optics of physics? What is true of the bent stick is also true of one's face seen in a mirror. One sees it in the direction from which it physically acts upon one's eyes. It is a fault of interpretation, not a fault of vision, if one fails to be aware of the fact that under these conditions the optical and the tactual directions of the face from the eyes do not interlock in the path of a Euclidean straight line. In other words, the optical and visual direction in this case is not the shortest tactual direction between two points. There is nothing in the phenomena of reflexion that prevents—there is everything that justifies—the literal interpretation of the statement that one sees one's own physical face when looking in the glass. The physical and the visual directions fit nicely into each other. It is true that we do not see *all* that is physically involved. It would be pleasant if occasionally we saw more of the physical, but the little of it actually seen is better than the none of it at all offered by Lovejoy.

In sum, one cannot put the new doctrines of the objective relativist into the framework of the older physics, with its prim space where things have 'simple location'. Whitehead's alternative to simple location is not the only one. This fact illustrates the danger of thinking that epistemological dualism in its unrestricted form is established by showing the untenability of isolated positions taken by individual monists. As Lovejoy himself suggests (p. 7), a successful skirmish is not a crushing victory.

3. "Respectivity" is the third meaning disentangled from the logical pell-mell of relativity. Of it Lovejoy says: "If a term possesses this logical attribute, it must be evident to anyone who understands the term that to predicate it of a subject means nothing at all unless a third relatum, of a definite kind, is specified" (p. 137) "implicitly or explicitly" (p. 92). "A 'respective' attribute . . . always, by its logical essence, implies a triadic, not merely a dyadic, relation" (p. 92). The examples he gives of such respective terms are "larger" and "to the left". By "logical essence" seemingly is

meant logical definition. With this meaning given to respectivity it follows of course that "the criterion of respectivity is—respectivity" (p. 137); and if there have been some indiscreet objective relativists who have argued that 'blue' for instance is a respective attribute of a physical object because by definition it logically implies a perceiver, Lovejoy apparently has got them. (I do not happen to remember any such philosophers.) Any one is surely misguided who tries by mere definition to prove the actuality of a physical relation. But likewise any one is not less surely misguided who tries by mere definition to disprove such actuality. But even in the realm of pure logic this criterion cannot be applied offhand. Terms do not come to us with their definitions aboriginally and indelibly stamped on them, as Mark Twain's Adam thought when naming the animals in the Garden of Eden. Even Lovejoy the logician does not *seem* to be always sure of his ground here; else why did he say, "It has doubtless always been evident to the plain man that it is meaningless to say that one thing is 'large', *or at any rate to say that it is 'larger'*, without mentioning something else with which the size of the first is compared"? (P. 92. The reader no doubt will have guessed that the italics are not in the original.)

When we leave logical implications of logical essences aside, and go to discovered facts, we find that, in pre-relativity physics, characters previously unsuspected of being respective were later found to be so. The ancients regarded 'up' and 'down' as absolute characters; for instance the atoms of Lucretius 'fell' without falling toward anything in particular; they just fell. And yet those who spoke of them as falling understood what the word meant. The respectivity of 'up' and 'down' to centers of gravitational fields was effectively discovered only a few centuries ago. When it was discovered, there were philosophers who argued exactly as Lovejoy now argues against the respectivities that are now under debate. Again, 'north' was regarded as an absolute direction till the time of Copernicus, when it became respective to the axis of the earth's rotation. On some other planet with a different axial inclination there is a different north. And so on and so on. The history of science is strewn with the wrecks of the principle that in physics, and generally in fact, as over against abstract logic, "the criterion of respectivity is—respectivity". Sometimes even a philosopher feels inclined to concede that scientists have good grounds for accusing philosophers of trifling with "logical essences" and with the meanings of words.

Lovejoy's treatment of the respectivity of simultaneity and of

spatial lengths in the physical theory of relativity (pp. 141 ff.) gets indeed a support (which however is adventitious) from the *epistemological* muddleheadedness of the popular expositors of that theory, from whom he quotes. Physicists display no unanimity with regard to the epistemological implications of their theory. Even such a distinguished physicist as Max Born is quoted by Lovejoy as saying that "the [FitzGerald] contraction is only a consequence of the way of looking at the event (*Betrachtungsweise*), not a change of a physical reality" (p. 145). In the first part of the statement Born speaks as an epistemologist, in the second as a physicist. Is it necessary to say that the second part is the more authoritative? Any "adequate discussion of the point", as Lovejoy remarks, "would demand a long inquiry", but surely he is mistaken when he goes on to say that this inquiry "would take us far from our immediate topic" (p. 147). Until such an inquiry is definitely terminated, the bearing of the physical theory of relativity on "our immediate topic" remains problematic. But whereas a long inquiry is impossible here, perhaps suggestions may be made as to the way an objective relativist might treat the subject.

First, he might say that the only safe interpretation of a mathematical theory in physics is obtained by examining the equations in which it is expressed, and by ascertaining the physical significance given in the theory to each measure-number used in the equations, such significance being ascertained by going back to the measurements that yielded the measure-number. Secondly, he might say that in treating of present-day physics the term 'physical' should not be given "the ordinary sense of that term" (p. 144). It would seem that in general physicists are agreed that any character is 'physical' if it is *measurable*. Planck has somewhere expressly defined the physical as the measurable; Eddington has identified the nature of the physical world as consisting of "pointer readings"; Bridgman has in substance said that anything is physical which is amenable to instrumental operation; and even the most cursory reading of Einstein's works shows that he is concerned solely with the metric (including directional) characters of objects. If this is what in 'modern physics' is meant by 'the physical' there can be no question that the shapes and sizes that are present in the field of perception, the *'immediately perceived'* shapes and sizes, are authentically physical. In fact it is *only from measurements made on what is thus immediately perceived* that any inference can be drawn to metrical characters *not thus perceived*. Hence any physicist who, accepting the definition of 'physical' above

given, should deny the physical character of the shapes and sizes directly measured would stultify himself, and would also by implication say that he has no physical basis for his statements about electrons and quanta and whatever else he talks about.

Now among the characters thus ascertained by measurement some have a more restricted validity than others. For instance, in applied analytical geometry, when measuring the length of a Euclidean straight line AB, suppose we arrange that A shall have the measure-numbers 0, 0, and then find by measurement that B has the measure-numbers 3, 4. All these measure-numbers are physical *by definition*, and a resulting measure-number 5 for the length of AB would, of course, also be physical. But it happens that the measure-numbers 3, 4, are more restricted in their validity than the measure-number 5. If however 3 and 4, *arrived at by measurement*, are not physical, then 5, arrived at not otherwise than by measurement or by calculation from measurements, is not physical. Now take a further step. We arrive by measurement at a measure-number c as constant, and, by four other measurements, at the measure-numbers, x, y, z, t; and from them by simple algebraic operations we get a measure-number $\sqrt{c^2t^2 - x^2 - y^2 - z^2}$. Suppose we found that the latter measure-number had a more general validity than the measure-numbers x, y, z, t, which were used in building it up; would that prove that the component measure-numbers are not physical? Now it happens that the measure-number given above under the radical is the simplest instance of a relativistic space-time 'interval' between two events, one event having the measure-numbers 0, 0, 0, 0, and the other the measure-numbers x, y, z, t. If the special theory of relativity is true, measurements made in different systems, moving relatively under the restrictions imposed by that theory, would in general give different measure-values to t, and to at least one of the other three, *viz.*, x, y, z; but the measure-number under the radical would be the same in all cases in question.

The 'observers', if personal,[4] come in only to make the measurements resulting in the various values of x, y, z, t. If their coming-in

[4] D'Abro, upon whom Lovejoy seems to rely largely in interpreting physical relativity, says: "The word 'observer' is a very loose term and does not necessarily mean a living human being. We might replace the observer's eyes by a photographic camera, his computation of time-flow by a clock—in fact, all his senses and measurements by recording instruments of a suitable nature, whose readings any man situated in any frame could check later. The results would still be the same." *The Evolution of Scientific Thought from Newton to Einstein*, Boni & Liveright, New York, 1927, p. 152.

makes these measure-numbers "epistemologically subjective" then it makes the measure-number under the radical doubly so, for not only do the various measure-numbers got by the various observers enter into the composition of *that* number, but also some calculator has to come in to discover that the value of that measure-number is invariant; it is not got by *direct* measurement. Now a physicist like Eddington seems at times to consider the entrance of observers into the transactions as making the whole business subjective; but this type of consideration is not *physics;* it seems to be *mystics.*

If what has been said is true of modern physics, then modern relativistic *physics* does treat the differences of shapes, respective to relatively moving frames of reference, as physical differences. When Eddington says that the proposition that "a moving rod becomes shortened in the direction of its motion" is "*true* but it is not *really true*" (quoted by Lovejoy, p. 145), he probably means two different things which we can distinguish into a physical meaning and an epistemological meaning. The physical meaning is that the proposition is physically true, but not true for *all* frames of reference; in its own frame the rod is not contracted. The epistemological meaning is that all measure-numbers are only symbolic: what they symbolize is something of the nature of our consciousness. Again, when D'Abro says, as quoted by Lovejoy (p. 146), that in the theory of relativity "real shape was removed from the status of a primary quality, and there was no sense in speaking of the shape of an object in a world devoid of all observers", he tells us in the context exactly what he means by this assertion. Any statement about shape "is indefinite until such time as the conditions of observation are specified", for it "entails the mention of a relationship to something else", namely, some reference-frame. "On the other hand, the generalised primary qualities", such as "space-time configurations and tensors", "transcend this specification of relationships, that are always of a contingent nature".[5] It is for this reason that shapes are not, and intervals are, for D'Abro and other physicists, characters of "the objective universe". This reason requires a brief examination.

What is meant by 'objective'? If all technically competent observers at Greenwich agree (within limits of tolerance) that an eclipse begins at mid-day (meridian time there), such agreement has always been regarded in physics as constituting the 'objectivity' of such date; at least it had been so regarded until some physicists flew off on an epistemological tangent. Now suppose that this same eclipse

[5] D'Abro, *op. cit.*, pp. 420–21.

is found by equally competent observers at Washington to occur at a different time, *i.e.* not at mid-day (meridian time there). This fact is also 'objective'. But when by some equation one of these dates can be transformed into the other, the two of them, no longer taken separately but each connected with the other by this transformation-equation, may be said to have 'greater objectivity', as representing an agreement among observers *operating under different conditions.* Exactly the same principle holds with regard to relativistic measure-numbers. The expression under the radical sign given a few pages back is, as we saw, one consisting of numbers got by measurements in *some* frame of reference. By the Lorentz transformation a similar expression consisting of similar measure-numbers got by measurement in any *other* relevant frame is found to have the same numerical value as the former expression. This numerical value may be said to have 'greater objectivity' than the values of the component numbers, since its value is the same in any two of these frames, whereas the values of the respective components are not in general the same for any two such frames. This 'greater objectivity' is simply a name for the fact that the same measure-number is obtained by observers operating *under more widely different conditions.* Thus an interval in relativity is 'more objective' than any spatial or temporal measure-number. But the 'lesser objectivity' of the latter is not the same as 'non-objectivity'. In the same way, we may, if we wish, speak of one measure-number as being 'more physical' than another, as representing agreement of measurements made under a greater number of differing conditions. But a measure-number that is 'less physical', according to this usage, is not thereby and therefore 'non-physical', *i.e.* 'epistemologically subjective'. Such measure-number is not a 'secondary quality' in the *historical* sense of that term, leaving the rôle of 'primary quality' to the 'more physical'.[6] But this is what D'Abro's statement suggests to Lovejoy.

It is this interpretation of D'Abro's interpretation of relativity that Lovejoy supposes to be "the one accepted by most physicists" (p. 147); at any rate, he says that "it is clear . . . that no other interpretation is *more* favorable to epistemological and psychophysical monism; and this is the only point that concerns us here" (p. 147). This remark shows that sometimes Lovejoy's heart is better than his

[6] The historical primary qualities are not obtainable by combination of several secondary qualities, and hence could logically be regarded as capable of existing independently of the latter; the intervals of relativity, on the contrary, *are* mathematical combinations of spatial and temporal measure-numbers, and have no meaning for us except as such combinations.

head; for, while he evidently desires to be fair to the objective relativist, he has chosen exactly the one interpretation of physical relativity that alone is unfavorable to his opponent. No wonder then that he concludes his discussion of shape by saying: "It is, at all events, sufficiently clear, I think, that relativity physics gives no real justification to the idea that the shapes of bodies are respective characters, in such wise that different shapes (in the usual sense of the term) may truly belong to identical particulars in the objective physical world" (p. 147)!

But I cannot conclude the discussion here. The subject of time must be taken up, if only in a cursory fashion. Lovejoy objects to relativistic simultaneity on the score that it is a case "of a respectivity made-to-order" (p. 142). But are not all concepts of physics made to order? The concepts of mass and energy and gravitation (and what not?) did not come ready-made and pinned as labels on physical facts, to be read off by any one with eyes to see. Archimedes, who knew them not, was neither blind nor illiterate. Galileo was accused of making a concept to order and just escaped with his life (and fortunately with his concept). The physicist has to elaborate his concepts (and thus make them to order) with a view to arranging the data of observation and experiment. The question about a physical concept is whether, being mathematically consistent, it satisfactorily orders what it is meant to order. If it does, and especially if it alone does, it is an authentic physical concept.

The main difficulty that Lovejoy has disclosed in relativistic simultaneity is thus stated: "To introduce the notion of respectivity in dealing with the retardations [in the case of the now famous fictitious twins, one of whom undertakes a journey to a star and returns ultimately to his brother] would obviously be absurd" (p. 144). He presents this difficulty while discussing "the contractions of lengths in the direction of *unaccelerated* relative motion and the retardations of chronometers" (p. 142, my italics). In connecting this problem with the special theory of relativity he has of course the example of Einstein himself, who in §4 of his paper of 1905 did exactly this thing. But any recent discussion of this problem by a competent authority, *i.e.* any discussion written after the publication of the general theory, recognizes that it involves *acceleration*, and treats it as so doing. Lovejoy refers in another connexion, as we have seen, to Max Born's *Einstein's Theory of Relativity*. He should therefore mention that Born says of the argument which Lovejoy repeats: "The error in this argument is obvious; the [special] principle of relativity concerns *only* such

systems as are moving uniformly and rectilinearly with respect to each other. In the form in which it has been so far developed [*i.e.* in the book from which this quotation is taken] it is *not* applicable to accelerated systems." When acceleration is taken into account "it is found that under all circumstances *B's* clock goes in advance of *A's* and thus the problem vanishes".[7] Thus after the acceleration involved in the return journey, the retardation is not 'bilateral'; it is 'unilateral'.

Hence if this is the only logical difficulty to be found in relativistic simultaneity, it may be taken for granted, pending the publication of Lovejoy's review of the whole subject (p. 144, footnote),[8] that diverse respective simultaneities are *logically* faultless, especially since they have been subjected to the most searching scrutiny by perhaps the largest number of competent examiners that have ever tested a logical theory.

Now if there is nothing illogical in predicating physical simultaneity and physical non-simultaneity of the same two events, each character being predicated with respect to some "third relatum", there is surely nothing logically wrong in predicating non-physical simultaneity of a set of events which are physically non-simultaneous. This provisionally disposes of the constantly recurring argument used by Lovejoy against all forms of epistemological monism, namely, that since for instance a star and the moon are perceived as simultaneous, and since physics informs us that the physical star and the physical moon, when they severally sent out the light that 'conditions' our seeing star and moon, were not physically simultaneous, therefore it cannot be the physical star and the physical moon that we see: *what* we see as simultaneous cannot be what in the physical world is not simultaneous. This is a beautiful argument if 'simultaneous' has always an absolute and invariable meaning; once admit the respectivity of simultaneity and the door is open for simultaneities that are not

[7] English translation by Henry L. Brose, New York, E. P. Dutton & Company, p. 216, where he refers to page 282, which treats the problem as one of acceleration. D'Abro is equally explicit in stating that the case of these twins does not come under the special theory (*op. cit.*, p. 236).

[8] Since writing the above I have read Lovejoy's article, *The Paradox of the Time-Retarding Journey*, in this volume of this REVIEW. I hope later to discuss this article, which seems to me to show a fundamental misunderstanding of relativity, apparently due to the use of popular expositions instead of the mathematical equations of the theory. An equally serious misunderstanding runs through his article, *The Dialectical Argument against Absolute Simultaneity*, in THE JOURNAL OF PHILOSOPHY, Vol. XXVII, Nos. 23 and 24.

physical, and that no more conflict with physical non-simultaneities than respective physical simultaneities conflict with respective physical non-simultaneities.

No, I cannot think that "certain conclusions" with respect to recent issues "have been definitely established". There has without doubt been too much cocksureness all around. The monist has been dogmatic in asserting his monism, and the dualist no less dogmatic in asserting his dualism. A more cautious, tentative, postulational attitude is in order, together with an attempt at a sympathetic understanding of the positions of opponents. This means of course trying to understand any concept of an opponent in the context of the whole system of his concepts. For this reason objective relativism cannot be dislodged by using only the Euclidean geometry and the Aristotelian logic of subsumption as a purchase. To change the metaphor, the voice that speaks in Lovejoy's book is indeed the voice of the twentieth century, but the hand that writes the book is in many spots suspiciously suggestive of an earlier age. But even at that, *The Revolt against Dualism* will without doubt be a most influential factor in clarifying the issues it discusses. As carrying that promise every philosopher will heartily welcome it.

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MR. WHITEHEAD'S PHILOSOPHY

With the appearance of *Process and Reality* it may be assumed that Whitehead has presented us with his *magnum opus*, the speculative completion of his system. If this is the case it becomes pertinent to discuss the system in its entirety. This we shall attempt to do as well as we may in the scope of a few pages. While it is not true to say that his thought is organically divided into an earlier and a later period, for our purposes it is both legitimate and easier to take two phases of it and treat them separately. These aspects can never be clearly demarcated, in one sense, for from the very first one runs across leads that are clearly developed only in the completed Philosophy of Organism.

The first phase of the philosophy is that found in *The Concept of Nature, An Enquiry Into the Principles of Natural Knowledge*, and *Introduction to Mathematics*. This is the group of writings in which Whitehead is most avowedly an exponent of Realism. "Nature is that which we observe in perception through the senses. . . . Thus in a sense nature is independent of thought. . . . What I mean is

that we can think about nature without thinking about thought."[1] "What is ultimate in nature is a set of determinate things, each with its own relations to other things of the set."[2] These 'things' are the 'brute facts' to which we must all come back if we would know anything about nature.

But what do we know when we know this type of fact? Three characteristics are distinguishable in our immediate experience of them. The first is denotative determination, or spatial differentiation. This is obviously a factor concerning spatiality, with the various *things* occupying different parts of an extended field. Some things are 'here', others are 'there'. ('Thing' here is a term of complete abstraction, referring to nothing more than the fact of occurrence. Every event or entity or actual entity is a *thing*.)

The second aspect is that of change, or temporal differentiation. No *thing*, or, as we shall hereafter say, *event*, is ever exactly repeated. It is this that gives reality to time. Because of the complete impossibility of recalling past events, when an event is past it is irrevocably gone. It can never recur in the uniqueness of its peculiar individuality.

The third character of any 'brute fact' is that of eternality, or temporal identity. Things change, but *aspects* of things also endure. Qualities are peculiarly recurrent. As change is expressed in the "doctrine of events", so permanence is accounted for in the "doctrine of eternal objects". These objects are "factors in nature which are without passage".[3] The fact that objects recur, whereas events do not, leads to a certain confusion of the distinguishing features. "Events are named after the prominent objects situated in them, and thus both in language and in thought the event sinks behind the object, and becomes the mere play of its relations."[4] The fact that the same eternal objects have ingression into two events is no criterion that the events are the same. The common element, which receives the distinctive name, is indicative of the permanence of the objects only; it bodes nothing for the events involved. The latter simply are, and are gone.

So much for the realistic and naturalistic elements of our study. This is unquestionably a strong part of Whitehead's position. We shall see, however, that it serves as the basis of a very pretentious development which certainly dwarfs, if it does not actually destroy,

[1] *Concept of Nature*, p. 3.

[2] *Principles of Natural Knowledge*, p. 73.

[3] *Concept of Nature*, p. 125; *Principles of Natural Knowledge*, p. 62.

[4] *Concept of Nature*, p. 135.

its foundations. One of the fundamental presuppositions of science and of a philosophy of nature is that of the orderliness of nature in all of its aspects. "There can be no living science unless there is a widespread instinctive conviction of the existence of an Order of Things, and, in particular, of an Order of Nature."[5] This order is more essential for Whitehead's purposes than it is for any particular science. Each science is interested in the possibility of discovering ordered relations in a special field. It is not much concerned whether or not this field is a part of a more inclusive order that relates it to every other branch of science. But the opposite is true of a philosophy that makes any attempt to bring the various sciences into a system. It is peculiarly important for a philosophy of organism such as we are now considering. If you think of the universe as an organism, its interconnexions are not to be thought of as the result of any fortuitous concourse. Relatedness is the very essence of organism. Thus if we are to think of reality in terms of the completely encompassing organism that this system suggests, there is no place whatsoever for contingency of any type. When we seem to find contingency it is because we are abstracting. We are only seeing a part of the whole. Really to know it we must get this part back into its relatedness.[6]

Some of us may feel that it is at just this point that Whitehead goes astray. His "concept of nature as the locus of organisms in the process of development"[7] apparently means much more to him than what he *actually discovers in nature*. It is at this point that he leaves behind his descriptive philosophy of nature and begins his speculative study. This element is in all of his philosophy, but now it becomes the character of it specifically and intentionally. It is felt that some such concept is required to keep us from running into bifurcations similar to those that started Modern Philosophy on its confused and baffled quest.

The explicit development of this view begins in *Science and the Modern World;* is carried along in *Religion in the Making, Symbolism, Its Meaning and Effect,* and the *Function of Reason;* and is finally completed in *Process and Reality,* at the end of which, "in so far as the enterprise has been successful, there should be no problem of space-time, or epistemology, or of causality, left over for discussion", for "the scheme should have developed all these generic notions

[5] *Science and the Modern World,* p. 5. Also *Religion in the Making,* p. 119.
[6] *Principles of Natural Knowledge,* pp. 12, 13.
[7] *Science and the Modern World,* p. 108.

adequate for the expression of any possible interconnection of things".[8] That Whitehead has now left the table of the realists with its solid fare, to pick up such illusory crumbs as he may at the hands of the idealists, will be all too evident.

In brief, one may say that the important doctrines in this second part of the philosophy are the following: that of "prehension"; that of "ingression"; that of "concretion"; and that of "feeling" as the fundamental character of being. Of course they all presuppose the doctrine of "organism", as has been stated. These together are the processes by means of which organisms come into being and are known. It must be borne in mind also that this part of the philosophy presupposes what has gone before. "Events" are continued under the names "actual entity" and "actual occasion".[9] The term "event", in *Process and Reality*, has a more specialised meaning, namely, "the more general sense of a *nexus* of actual occasions, inter-related in some determinate fashion in one extensive quantum".[10] "Eternal objects" are also continued, although there are now two species of them—the objective and the subjective. The distinction is based on "the antithesis between publicity and privacy" as reflected in "their primary modes of ingression into actual entities".[11]

Prehension is unification. It "may or may not be cognitive . . . . Realisation is a gathering of things into the unity of a prehension; and . . . what is thereby realised is the prehension, and not the things. This unity of a prehension defines itself as a *here* and *now*. . . . The things which are grasped into a realised unity, here and now, are not" the things simply in themselves, but the things "from the standpoint, in space and time, of the prehensive unification".[12]

It will be seen that prehension is practically synonymous with perception. The reason the more common term is not used here is that it leads to a ready acceptance of a position which Whitehead regards as false, and so wants to guard against. This is true of all of his original and forbidding vocabulary. Perception has come to mean some sort of a passive awareness of things presented to experience. This is quite contrary to prehension. Prehension is a process of unification. There is no such thing as awareness of things as themselves 'out there'. We are aware only of aspects of things unified in prehension. Another, and equally important, distinction is that

[8] P. vii.
[9] *Ibid.*, pp. 27, 28.
[10] *Ibid.*, p. 113. My italics.
[11] *Ibid.*, p. 445.
[12] *Science and the Modern World*, pp. 101–103.

whereas perception is almost always used as though it involved a cognitive element, the term prehension is used for "uncognitive apprehension" [13] as well as cognitive; it "was introduced to signify the essential unity of an event, . . . the event as one entity, and not as a mere assemblage of parts or of ingredients". [14]

The non-cognitive aspect of prehension is more important for our purposes than the cognitive. In the last analysis this becomes unificatory awareness through sympathetic feelings. In the Categories of Explanation "positive prehensions" are identified with "feelings". These positive prehensions are the feelings of a subject. And a subject is the unity of an event, a unity of prehension; of any event, of any prehension.[15]

The limitations on this process, which keep everything from knowing all things, are two. First there is the doctrine of satisfaction. This is the "final phase in the process of concrescence constituting an actual entity. . . . The many feelings which belong to an incomplete phase in the process of an actual entity, though unintegrated by reason of the incompleteness of the phase, are compatible by reason of the unity of their subject [The Category of Subjective Unity]. There can be no duplication of any element in the objective datum of the 'satisfaction' of an actual entity, so far as concerns the function of that element in the 'satisfaction'. Here as always the term satisfaction means the one complex, fully determinate feeling which is the completed phase in the process [The Category of Objective Identity]." [16] You can see what this means. Every actual entity is a society of feeling which is determined by the subjective aim of the actual entity. The end which this subjective aim seeks to realise is satisfaction. This is true of human subjects; it is true of the great gray Castle Rock in Edinburgh. Value is the key to the whole of existence; value is the form of purposes to be realised by every entity.[17]

The principle of Concretion, or God, as it is called in *Science and the Modern World*, is the second principle of limitation. "Every actual occasion is a limitation imposed upon possibility, . . . by virtue of this limitation the particular value of the shaped togetherness of things emerges. . . . Each individual activity is nothing but the mode

[13] *Science and the Modern World*, p. 101.

[14] *Ibid.*, p. 106.

[15] *Process and Reality*, pp. 88–89.

[16] *Ibid.*, pp. 38–39.

[17] A very brief but lucid statement of this position is found in *Religion in the Making*, pp. 101, 102.

in which general activity is individualised by the imposed conditions. . . . According to this argument the fact that there is a process of actual occasions, and the fact that the occasions are the emergence of values which require such limitations, both require that the course of events should have developed amid an antecedent limitation composed of conditions, particularisation, and standards of value. . . . Some particular *how* is necessary, and some particularisation in the *what* of matter of fact is necessary."[18] "God is the ultimate limitation."[19] This simply means that there is a more inclusive actual satisfaction in the world which controls the satisfactions of the less inclusive actual entities. In this more inclusive actuality, therefore, lies the creativity of the whole process. The whole order of the world is determined by creativity under the influence of value. The creativity thus influenced is God. As a result of God's nature, the order of the universe is æsthetic.

This function of limitation in God, in *Science and the Modern World*, is partly taken over by the doctrine of "negative prehension" in *Process and Reality*. A negative prehension limits because it "excludes from feeling". But in excluding the feeling of one actual occasion from that of another, a negative prehension yet relates them, for exclusion is a negative relation. By so tenuous a thread as this hangs the complete internality of relations. Having been relieved of this function, God now becomes the quintessence of possibility. The limits of all that may be are in him. Thus is the timelessness of the eternal objects preserved in grander state. But this timelessness is not yet quite Spinozistic. There remains a difference between being actual potentiality and being potentiality actualized. And by another thread so tenuous as this hangs the reality of time and process.

The question of how limitation is introduced brings us to the Doctrine of Ingression. Ingression is the term used to designate the process by which different types of reality interact. It will be remembered that there is a dual aspect in all experience. Things change; things are permanent. What are the conditions that determine what particular changeless objects shall go to make up *this particular* event? In so far as this is a problem related to the self-creation of an actual entity, ingression means participation. Events have ingression into other events; they participate in the self-realization of other events. This part of the doctrine is relatively simple, if we accept the appetitive nature of the process of concretion as it

[18] *Science and the Modern World*, pp. 251–256.

[19] *Ibid.*, p. 257.

has been developed, because the mutual ingression of actual entities by each other can take place on the non-cognitive level of prehension. But this is not true of the ingression of eternal objects. This can take place only on the cognitive level; or rather, a prehension of an eternal object is a cognitive prehension. But cognitive prehensions are limited to actual entities having a very special kind of feeling, namely, cognitive feeling. Nevertheless, eternal objects do have ingression into non-cognitive entities. And, on the other hand, cognitive entities, such as you and I, are more apt to recognise the fact that in some way eternal objects have had ingression into actual occasions, than we are to be aware of the process which makes the ingression possible, even in cognitive prehensions. Thus the problem of how ingression takes place is apt to turn out to be like those questions that naughty children ought not to ask, or which mother is too busy to answer.

When we undertake a search for some more definite statement we finally come across the following: "The term 'ingression' refers to the particular mode in which the potential of an eternal object is realised in a particular actual entity, contributing to the definiteness of that actual entity. . . . The functioning of an eternal object in the self-creation of an actual entity is the 'ingression' of the eternal object in the actual entity."[20] It all comes back to God as the principle of concretion. God "is that actual entity from which each temporal concrescence receives that initial aim from which its self-causation starts".[21]

This statement of the doctrine of ingression has disclosed nothing of the nature of eternal objects as residents of an eternal realm of forms. This is one aspect of them. But we must draw the line somewhere; since this question simply raises further metaphysical problems, and does not help us to solve the ones already raised, we shall have to let it go after having taken cognisance of the fact that a difficulty does exist here. It is largely a reopening of the problem of the Platonic Ideas and the Essences of the Critical Realists.

Various problems of the nature of God have been hinted at that should be more fully dealt with, but cannot be dwelt upon here. Suffice it to say that beyond his character of limiting all individual self-realisation, and his character as *possibility*, God is not the whole of reality. He is an actual entity having limitations. He is more inclusive than any other entity. In some way he has peculiar rela-

[20] *Process and Reality*, pp. 34 and 38.
[21] *Ibid.*, p. 374.

tions to all other actual entities on the one side and to the eternal objects on the other.

The question of the peculiar status of space-time in the earlier works, and the influence of Alexander on Whitehead's thought, is another point that has been ignored. This for two reasons. He repudiates his earlier position in his later works. Whereas space-time came very near having some such primordial status as it has for Alexander in the earlier period, it is definitely set aside for the more Bergsonian term of Creativity in the later one. Here again to follow this question would lead only to a by-path.[1]

The doctrine of feeling has been hinted at enough in the explanation of prehension, ingression, and concretion, to make unnecessary, for our purposes, any further statement about it.

In evaluating the system we have been presenting, it must be continually kept in mind that it started as a Philosophy of Nature. It may be expected that its problems arose from that field. We have seen that such was the case. And the problems are real. Anyone who has thought in terms of possibilities, organisms, relations, and the like, will recognise the poignancy of the issues developed. How can one account for that nebulous realm of possibility which continually throws away "the best laid plans of mice and men" by showing in future actualisations aspects of experience never imagined previously? How is the organic character, so obvious in the case of some parts of nature, to be explained unless as attempted by Whitehead? What of this matter of the internality and the externality of relations? How are the many repeated sequences, the wide-flung consequences from comparatively trivial events, to be accounted for unless all nature is one related whole? But, on the other hand, why do things that can be reasonably expected to follow from other things sometimes turn out to be amazingly divergent? So with other difficulties that the philosophy of science continually presents to us. Whitehead has striven honestly to answer them. Why does his answer meet with such incredulous response from his peers?

Possibly not the least reason is temperament. It seems unquestionable that this system is the product of a mind peculiarly sensitive to those demands that have produced the great speculative systems of the past. This is an attempt at explanation. The common current of the age, in no small measure, due to the scepticism of science itself, spends itself rather in description. This is true even in philosophy. We have become imbued with an experimentally justified caution that is not overly interested in settling ontological and cosmological pro-

blems of such universal scope. We take our universe piecemeal, as if it were really the pluralistic thing our descriptions imply. This does not necessarily mean superficiality. Some very subtle and stimulating work has resulted. But it does mean that our *Zeitgeist* is empirical rather than rational. Empiricism can never be aught but pluralistic.

There is another and more critical basis for placing the new messiah in the rôle of the one "despised and rejected". The type of experience he has based his system on is real, and not to be denied. "There is no man . . . who has not, at one time or another had the rare moment of emotional exaltation and instantaneous vision, the persistence of which might make him understand it. These flashes of inexpressible emotion, universally experienced, are in themselves sufficient to make the whole world vaguely mystical; . . . to make scientific scepticism itself, occasionally, somewhat more than sceptical of its doubt."[22] The question is, does it carry the peculiar relevancy to all experience and all reality that is claimed for it? Probably not. Is it true that out of our most primitive emotional experiences, these vague forebodings of unseen presence in dark places, this quest for light "in the night in which all cows are black" is the right tack to follow if we would be truly *en rapport* with ultimacy? It seems hardly likely, although better minds than ours have spoken in its favor. This aspect of Whitehead's philosophy became obvious in *Symbolism, Its Meaning and Effect,* relative to his treatment of causal efficacy.[23] The peculiar intuitional character of it, as it becomes knowledge through the sympathetic feelings of *Process and Reality,* makes one think of that æsthetic or mystic type of experience in which one is 'identified with his object' in a sense far different from that of 'knowing the object'.

Such mystical identification may take place. If the great mystics are to be believed (and we have no reason to question their statements), it is a fact that such experiences are real. Moreover, it seems unlikely that they can be wholly accounted for by determining the dietetic habits of those who have them, as some of our physiological psychologists would like us to believe. None the less they seem to lack both the frequency of occurrence and the agreement as to their peculiar meaning and relevance that are necessary to give to any experience such import as these bear to the whole system under consideration. It could well be answered that this seems to be the case only in conscious reflexion, and conscious experience can ac-

[22] Frederick Barry, *The Scientific Habit of Thought,* p. 75.

[23] Especially pp. 39–49.

count for only a meager part of our time. This is true, more or less. Large areas of our experience of, and contact with, the world of nature are not conscious. Within those areas we can make some surprisingly subtle adjustments to other objects. Two points must be noted in this connexion. First, most activity successfully carried out without consciousness acting as guide has at some earlier time been specifically under conscious control. These experiences are therefore not intuitional but habitual, if we may contrast attitudes in this way. Secondly, the problem that Whitehead sets us is one which inescapably requires consciousness. With all his distrust of language, he is undertaking a critical evaluation of experience, knowledge, and reality, which is peculiarly rational. It reminds one of the great extent to which Bergson uses reason both to point out and to prove the validity of an intuition that by definition can never be rationally known. This is not a dialectical problem. It is one of methodology. Any such ultimate categories as those introduced in *Process and Reality* must be amenable to rational verification. Otherwise we lose the very agreement which is supposed to be one major value of the system, the goal that such philosophical systems set for themselves. Intuitions are famous for their incommensurability.

It is true that the answer attempted would solve one of the problems from which the system arose, namely the problem of knowledge. The formal difficulty of epistemology is well pointed out in the hue and cry against bifurcation. By identifying all actuality with a system of feelings one immediately breaks down the duality of nature. But after all how fare these attempts at substantial or substrational identification? Idealists recognise nature as 'appearance'; materialists allow the mind to continue in the dubious term 'epiphenomenon'; so feelings must be variegated in some more fundamental way than is indicated in either phase of the process, *i.e.* that of actualisation, the process going on; or that of concretion, the process actualised. The theoretical difficulty may disappear, but the practical difficulty, even for knowledge, remains. When one considers the difficulties that accompany this solution, like a train of camp-followers never wanted but always there, as soon as its cosmological and ontological implications become apparent, one realises how great is the price paid for the formal epistemological satisfaction.

It seems that, even with all due respect to the genius portrayed in this most recent system, we shall have either to be satisfied yet a while longer with the pluralism of empirical philosophy, or to turn to other than feelings for our objectivity and unification. In thus

emphasising feeling Whitehead has certainly committed his own well-named "fallacy of misplaced concreteness" in a grand manner; the part has come perilously near engulfing the whole. Value is a very real aspect of our experience; but needless to say, as a phase of that experience, it does not become the criterion of the fundamental character of all reality.

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REVIEWS OF BOOKS

The Philosophy of John Dewey. Selected and edited by JOSEPH RATNER. New York, Henry Holt and Co., 1928. Pp. xii, 560.

Though of doubtful value for the lay reader, for whose enlightenment it was intended, this outline of Dewey's philosophy in its entirety renders an important service. Students and teachers of contemporary thought will welcome it as a great time-saver and as an important document in determining the logical relationships between the various departments of Dewey's philosophy. The book is unsuited to the lay reader, in the judgment of the reviewer, both because the 'logical' order of the topics is didactically unsuited to popular interests and because the controversial character of contemporary philosophy is generally, and certainly in Dewey's case, much too central to be expunged. The popular reader, whom the editor indulges in trying to spare him controversial entanglements, needs to be reminded that the most instructive introduction to pragmatism is the historico-critical approach through which pragmatism actually developed.

Looking at the book from the professional point of view, and assuming that its contents are by now familiar, we may note certain issues in the pragmatic controversy which need clarification and which seem most vital in the future development of pragmatism to one who shares, and is profoundly indebted to, Dewey's philosophical point of view. The issues referred to are receiving sharpened relevance in divergencies in an as yet inchoate movement of certain younger writers that is known as neo-pragmatism. Though I am sympathetic with the constructive purpose of this movement, I am concerned about its foundations or alleged foundations in pragmatism, and believe that a better understanding of its premises should be had before it draws further conclusions.

The fundamental question in a constructive criticism of Dewey's pragmatism, as I see it, is whether it provides an adequate metaphysics. This question depends largely upon the further one, not easily answered, whether Dewey's philosophy of life is in fact what his disciples or many of them take it to be. Mr. Ratner gives point to these queries in presenting philosophic method and naturalistic metaphysics first the "order demanded by the logical development of ideas and the natural relationships of the various branches of philosophy to one

another". I had supposed that pragmatism's chief claim to distinction was its challenge of this conventional conception of the logical order of ideas, that pragmatic empiricism meant that metaphysical principles like all principles are derivative rather than primary and hence should appear last. The point is more than a verbal one. It may be said that the metaphysical doctrine of *Experience and Nature* was implied in *Essays in Experimental Logic*. I am but employing the genetic or pragmatic method in the reminder that the logical theory came first and the metaphysics afterwards. Furthermore, it is not without significance that the metaphysics came after repeated criticisms had been made of instrumentalism, condemning it because it lacked the completeness of a metaphysics. To me *Experience and Nature* seems a much richer and more satisfactory philosophy than I find in Dewey's earlier logical writings, a genuine development in his thought or in his empirical findings. Theretofore there was a danger that naturalistic metaphysics would be so exclusively oriented with reference to the logical aspects of experience that other, and important, aspects would be denied a hearing in their own right; there was a danger that the metaphysics would simply be an extension of the logical theory.

I believe this difficulty has not been wholly surmounted. There are two respects in which the naturalistic metaphysics of *Experience and Nature* marks an advance over the earlier instrumentalism, and these are noteworthy as indicating the direction which further advance should take. Instrumentalism was referred to by realists and idealists alike as 'immediate empiricism' or subjectivism, a species of subjective idealism. The realist attacked it because it seemed to assign no independent reality either to the past or to the present outside experience. The idealist attacked it because it took for an immediate experience what was an affair of meanings and hence of thought. The instrumentalist countered the realist charge by speaking of the past as a projection back from the present, or as a statement of the conditions for present action. The objectivity of the present external world was thought to be properly accounted for in the notion of interaction within experience between the individual and stable objects, and objectivity in general was linked with the social character of experience. *Experience and Nature* cleared away the difficulty by making the distinction between events as existences and events as objects. This realist development of naturalistic metaphysics was signalized by Murphy's term "objective relativism", which he applied to Whitehead and Dewey. Instrumentalism was being rounded out by a more adequate empiricism.

The idealist's objection that there is no immediate experience was met in Dewey's earlier writings by the distinction between the object as directly experienced and as existentially conditioned, what the idealist pointed to as interpretation or judgment being referred to as part of the existential conditions rather than as meanings. The immediately experienced object vouched for itself as an immediate certainty. *Experience and Nature* disposed of the difficulty by explicitly affirming that *all objects* are meanings, and by distinguishing between meanings that are simply had or enjoyed and meanings that are known. The former make no pretension to certainty, for certainty is a cognitive matter acquired by ideas experimentally tested, whereas objects had or enjoyed, though obviously just what they appear to be, events with accepted meanings making sense, are when taken from the standpoint of judgment hypothetical or problematic. They raise questions rather than answer them; what are the data or the given is as much a matter for determination as the meanings. Dewey showed that the idealist's criticism arises from confusing experimentalism with sensationistic empiricism. Such difficulties might disappear if instrumentalism were consistently referred to as experimentalism rather than as immediate empiricism.

Now while the development which we have noted in the naturalistic metaphysics fortifies the experimental logical theory, it raises a question as to the adequacy of a metaphysics of empiricism resting so heavily on the logic of experimentalism for its foundations. There is need now for a clearer recognition and a faithful description of wide areas of experience or of nature which are not comprehended within the logical area as Dewey has defined it. Indeed he has repeatedly told us that the besetting fallacy of philosophy has been its assumption that all experience is a case of knowing. But do we not in large measure perpetuate the fallacy in claiming that what we mean by value and truth has its *full* import in experimental thinking? It would be strange irony indeed for the experimentalist to profess that the function of thought is instrumental only to go on to treat it as virtually constitutive. There has been plenty of misunderstanding of pragmatism which it is hard to believe is due to anything but a prejudice against it, but the persistent notion that it makes a fetish of action and change, and that it is superficial as a metaphysics, may have some basis in fact. The forward dimension of experience is extremely important, but so are its breadth and depth, and pragmatism has not sufficiently explored the latter. Here is an opportunity which pragmatism as empiricism is obligated to seize, and which *Experience and Nature* recognizes, if the aforesaid developments are as I believe indicative.

The conflicting tendencies which divide pragmatism, and which are becoming increasingly prominent in the younger pragmatists or neo-pragmatists, can be given explicit statement. The logical theory was born of controversy, and it was easy to adopt an extreme position in refuting the opposite extreme. The metaphysics goes to experience and is bent on preserving the truth in each phase of experience and in rival theories. In logical theory, where Dewey has the epistemological dualists in mind, he escapes transcendence by taking the extreme position that the object of knowledge is wholly in the future. It is in this mood that he asks: "Moreover, do not changes actively effected constitute the whole *import* of the knowledge, and hence its final measure and test of validity?" (p. 165). Truth here is *simply* verification, the fulfillment of the specified consequences of the idea, which consequences in turn mark the whole meaning of the idea which gets known. It is enough however to say that verification is essential to the meaning of truth; it is not necessary to say that it is the whole meaning. To demonstrate the former proposition is not to demonstrate the latter. And this I take to be the kernel of truth in Lovejoy's contentions. If I believe that there are electrons in nature I mean not only, though that is essential to my meaning, that certain predicted consequences will be observed, but also that those consequences are continuous with the electons that are now there.

This version of the matter, I believe, comes nearer to Dewey's real belief, is given explicit utterance at times, and seems to be demanded by his realist conception of events as existences as well as objects. If verification fulfills the intention of an idea, it does it by pointing backward to the presence of the thing meant. Otherwise concepts in science might be regarded, as at times unfortunately they have been, simply as useful fictions. Dewey pretty nearly makes my point in a distinction which he once drew between the content of an idea and its reference. "The content of any idea about yesterday's rain certainly involves past time, but the distinctive or characteristic aim of judgment is none the less to give this content a future reference and function" (*Influence of Darwin on Philosophy and Other Essays*, p. 161). The future reference, though essential, is essential precisely because it in turn is a reference back to the content which it fulfills. In explaining knowledge of the past Dewey affirms, as I understand him, that we really know the *past* so far, of course, and only so far as we get hold of the consequences left by the past which *connect* the idea with it. The object known as "signified" is, if I understand Dewey, the consequences or the object *qua* future; but the object known as "significant" or directly meant is the past event. Both are essential to knowledge.

In his fear of getting caught in the bog of transcendence and in his consequent overemphasis on utility, on the extrinsic function of ideas, on means and instruments, the pragmatist has given us a one-sided theory of ends or values. Thus T. V. Smith tells us in *The Philosophic Way of Life* that "the esthetic way of life is an idea-way to happy souls harmoniously nurtured and materially subsidized", and he proposes "that beauty in useless ideas shall not be put above, but kept below, that resulting from demonstrated utility". This is the result of the aforementioned emphasis on the reference to the neglect of the content of ideas. One can be sympathetic with the pragmatists' bitter opposition to economic privilege without accepting the queer conclusion that all values which are possessions (private affairs) are of a lower order than those that are instruments (public affairs). In our passion for democracy we shall miss many of the things in life that are eminently valuable, and require the disciplined development of taste, if we are determined to seek the value of each thing in its utility for the next. It is not the business of democracy to tell us what is beautiful or valuable in life, much less to scale down values to a common level. Democracy is pretty clearly stated in *The Public and its Problems* as a means, not an end; a means of increasing, liberating, and enriching values. Esthetic and religious values should indeed be given a socialized expression, should not remain the possessions of the few; nevertheless as values they are possessions, not instruments, and they belong to individuals, ranging in the depth of their value with the depth of the individual experiences.

I refer to T. V. Smith's book because its eloquent title and its argument challenge us to ask again just what pragmatism is, as a statement, not simply of logical theory, but of the philosophical way of life. To answer that pragmatism is naturalistic metaphysics explains little, for that is likely to be a disguised way of saying instrumentalism or experimentalism, a eulogy of the scientific and social ways of life and a disparagement of its esthetic and religious aspects. We get a quite different meaning when we assign instrumentalism its rightful place and function *within* naturalistic metaphysics. We get a more balanced conception of the logical theory, and, what is more important, a more balanced conception of what is essential in a complete philosophy of life. As Dewey pointedly says in *Essays in Experimental Logic*, "while reflective knowing is instrumental to gaining control in a troubled situation (and thus has a practical or utilitarian force), it is also instrumental to the enrichment of the immediate significance of subsequent experiences. And it may well be that this by-product, this

gift of the gods, is incomparably more valuable for living a life than is the primary and intended result of control, essential as is that control to having a life to live" (p. 17). The importance of the redirecting function of intelligence is so great that the pragmatist may be pardoned for the exaggeration in speaking of "creative intelligence", but he should remember that values are reconstructed, not constructed, by intelligence. If the pragmatist takes his naturalistic metaphysics seriously, he will become increasingly concerned with the values of appreciation, objects of beauty and of spiritual devotion which must coöperate with thought to make life significant. To oppose supernaturalism with scientific method is a good beginning, but it is only a beginning. It is a preparation for finding within nature the secondary, tertiary, and higher values which supernaturalism, because of the scientist's mechanical conception of nature, had to look for, in vain, beyond nature.

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Philosophie der Raum-Zeit-Lehre. By HANS REICHENBACH. Berlin, Walter de Gruyter Co., 1928. Pp. vi, 380.

Books on the theory of relativity fall into three main classes. There are those, such as Whitehead's, which concern themselves with certain problems of motion and metrical uniformity to which Einstein's discoveries have given rise. There are those, such as Eddington's, which combine an exposition of the theory with certain interesting interpretations of it. And there are those, such as D'Abro's *Evolution of Scientific Thought from Newton to Einstein*, which begin with the mathematics and physics and epistemology of the theory and allow it to reveal its own meaning when subjected to analysis. Hans Reichenbach's *Philosophie der Raum-Zeit-Lehre* falls in the latter group. While not as readable as the book by D'Abro, it is more sound and exact in its philosophical comments, and the most thorough logical analysis of the theory that has appeared. It is equivalent to several courses on the foundation of geometry, the operational, intuitive, and physical basis of scientific procedure, the theory of relativity, and the relation between perceptual and conceptual factors in knowledge.

Reichenbach's account of the meaning of the theory of relativity will provide little that is new to one who is acquainted with Einstein's original papers. But points which were evident in Einstein's papers are made specific by Reichenbach. However, those who have gained their conceptions of Einstein's work from the supposedly authoritative expositions which are current, will find many of their conceptions

altered by the reading of Reichenbach's book. For example, his analysis reveals the unequivocal physical foundations of the theory, deprives dimensions of the ontological status that so many writers attach to them, and explodes the common notion that the relativity of Einstein's theory is a relativity to mind.

But these are the bare rudiments. Many factors of originality appear. Three major points may be noted here.

The distinction between two types of definition is fundamental in Reichenbach's analysis. He calls them the *Begriffsdefinition* and the *Zuordnungsdefinition*. The former involves the statement of one concept in terms of others. A typical case is a definition in the *Principia Mathematica*. It need never take one out of pure mathematics or logic. The *Zuordnungsdefinition*, on the other hand, always involves a reference to reality. A concept is correlated with a denotative empirical factor. The concept of the unit of length which is defined as the standard rod in the Bureau of Standards is a typical example.

Because such definitions depend upon a convention, they are somewhat arbitrary. One of the most important errors for any one to avoid is the confusion of questions of knowledge with questions of definition. When such confusions arise pseudo-problems (*Scheinprobleme*) appear. It is because the geometry of relativity-physics is defined by a *Zuordnungsdefinition* of congruence which involves a correlation with a physical object, that it is a part of physics rather than of the logic of relations. And because of the element of arbitrariness that enters into a *Zuordnungsdefinition*, all physical geometry is relative. But physics also imposes an element of necessity on geometry. Reichenbach goes into this topic very thoroughly.

One slight criticism of his position may be put here. He calls the question whether the rod in the Bureau of Standards is a truly rigid rod a *Scheinproblem*, on the ground that it is meaningless since rigidity is a matter of definition rather than of fact. His own analysis reveals, however, that the question is not meaningless. For in order to explain why an angle-worm is not as good a ruler as the instrument in the Bureau of Standards, or why a gas or a liquid cannot be used, he has to define a solid object. He does this in terms of a configuration of particles, thereby accepting the kinetic atomic theory. Once this is implicit in his definition of a rod a meaning for rigidity is present. The rod is rigid if the relations between its atomic parts do not change, and non-rigid if they do. That this *Begriffsdefinition* enters into the physicists' conception of the rod is clear; otherwise, as Whitehead has noted, he would not correct for the contraction of the rod. The point is that one's theory

of the behavior of one's rod, and one's theory of the rest of one's physics, cannot be separated. Conventions are not established without regard to the philosophical first principles of one's science. Reichenbach makes this clear in his treatment of Weyl's theory, in which the electrical field modifies the length of one's rod. But even before Weyl's introduction of gauge-curvature, the physicist corrected for the contraction of his standard rod. Why? Because his convention was coupled with the kinetic atomic theory of solid bodies, from which it followed that changes of temperature would cause a change in length. This consideration suggests that with a more accurate knowledge of the way in which primary matter conditions the lengths of the given objects which we use as measuring-rods, the arbitrariness in our scientific descriptions will tend to disappear. Nevertheless, Reichenbach's emphasis upon this arbitrary factor is important, as it represents something very real in our present scientific procedure.

The second point of major importance in his book is his treatment of the simultaneity of spatially separated events. At this point he deviates from the definition given by Einstein. Hence the reader should consult Einstein in conjunction with Reichenbach. The essential point in Reichenbach's analysis is the distinction between events whose temporal sequence is determinate (*Zeitfolgebestimmt*) and those whose temporal sequence is indeterminate (*Zeitfolgeunbestimmt*). It is to be noted that Einstein ignores the latter type of relation between events. He determines a point mid-way, in a given frame, between two spatially separated events, and defines their simultaneity in terms of the simultaneous arrival of light-waves at the mid-point. In short, the simultaneity of spatially separated events is defined in terms of the simultaneity of spatially coexistent events and light-propagation. It is to be noted that simultaneity is defined in terms of the determinate relation of two spatially separated events to an event which is located equidistant from them and connected to them by light-propagation. Once this definition is accepted the relativity of space and time for different frames of reference follows.

But Reichenbach proceeds in a different fashion. He uses the fastest available signal (*Erstsignal*) *i.e.* light-rays, to order events at different places in the same frame in a common temporal series. Such events are *Zeitfolgebestimmt*. But there are spatially separated events which are too near each other temporally to be joined by any available signal. Such events are *Zeitfolgeunbestimmt*. Events which are *Zeitfolgeunbestimmt* are simultaneous. But Reichenbach has no difficulty in proving upon this basis that any event at one point has a

large number of events at another point with reference to which it is *Zeitfolgeunbestimmt*. Thus the simultaneity of spatially separated events is ambiguous. In this respect his position is similar to that of Whitehead, except that he follows Einstein in the use of light-signals. Simultaneity can be made definite only with a *Zuordnungsdefinition*. Since there are a large number which are possible, such definitions are arbitrary, and simultaneity is relative.

It is to be noted that Reichenbach reaches these conclusions within a single frame of reference. Thus his analysis leads to the conclusion that the relativity of simultaneity does not depend on reference-frames. He makes a great deal of this point, ciriticising those who have defined the relativity of time in Einstein's special theory in terms of the relativity of reference-frames. He maintains that Einstein's relativity to reference-frames follows only when a certain *Zuordnungsdefinition* is prescribed.

Two points may be noted. First, Einstein does not define the simultaneity of spatially separated events in terms of the indeterminate rationel between them, but in terms of their determinate connexion by light-rays with a common event equidistant from them. The case of events which are *Zeitfolgeunbestimmt* never enters into Einstein's analysis, hence the relativity of simultaneity in the special theory is not defined independently of reference-frames as Reichenbach insists. Second, even if we grant the superiority of Reichenbach's approach, it still remains true that the principle of the relativity of simultaneity in Einstein's special theory is a relativity to reference-frames and not the relativity within a single frame that depends upon a *Zuordnungsdefinition*. For the relativity which arises is one that appears after the *Zuordnungsdefinition* is specified, indicating quite clearly that the reference-frames rather than the *Zuordnungsdefinition* are its source.

Reichenbach's most original contribution appears in his treatment of Weyl's unitary-field theory. The details cannot be given here. Suffice it to say that he gives a definition in physical terms of the part of the geometry of Weyl's theory that cannot be referred to the actual behavior of measuring-rods. This incapacity in Weyl's theory was one of the factors which caused Einstein to bring out a new unitary-field theory. Reichenbach's contribution is of philosophical significance since it makes Weyl's theory quite consistent with the physical philosophy of science which the general theory of relativity necessitates.

There are many other interesting points in Reichenbach's excellent

book. His treatments of dimensions, of the relativity of motion as conceived by Newton, Mach, and Einstein, and of the relation between conceptual and perceptual factors in knowledge, are exceptionally good. Also his account of causality is most stimulating.

In details and as a whole the *Philosophie der Raum-Zeit-Lehre* is an excellent book. It builds up Einstein's final achievement out of understandable elements and gives one the impression throughout that the author has come to grips in competent fashion with the physics and mathematics and experienced materials of the theory itself. Certainties rather than interesting speculation are brought into the foreground. Nor does the book lose in philosophical interest because of this more solid approach. To be sure, the important philosophical problems of motion and metrical uniformity arise at the point where Reichenbach ends, and there is no evidence of his awareness of their existence. But before one can consider the more basic problems, one must understand the theory of relativity itself; and for this purpose there is no other book which is as logical and thorough, and at the same time fruitful in its suggestions for philosophy. It may be added that Reichenbach's treatment of the *Zuordnungsdefinition* provides an excellent introduction to the positivism of Schlick and Carnap and the Viennese School.

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Le socialisme. By Émile Durkheim. Edited by M. Mauss. Paris, Alcan, 1928. Pp. 352, xii.

This, the first third of an uncompleted history of socialism, brings us from the eighteenth century as far as Saint-Simon and his followers. It gives us a masterly analysis of the origins of modern socialism, although the work of Saint-Simon himself has been more exhaustively dealt with, since Durkheim's account, by Charléty, Bouglé and Halévy, G. Dumas, and M. Leroy; it gives us an interesting insight into Durkheim's own attitude towards the socialistic movement; and it presents, for our present judgment, a portrayal of the issues involved in nineteenth-century socialism by one who is a master of exposition, but who approaches his study *parti pris*. The book was written as a series of lectures in 1895, after Durkheim had completed his sociological studies on the division of labor, on suicide, on the family and on religion; and the study of socialism is taken up in the same scientific and historical spirit; but we are told by the editor that Durkheim wished also to defend his own attitude against the accusation of collectivistic leanings,

by making clear the moral tradition which underlay the development of socialism. The history was to be carried forward to Fourier and Proudhon, and to Lassalle and Marx; but this intention was prevented by the foundation of L'ANNÉE SOCIOLOGIQUE, which absorbed henceforth Durkheim's energies.

Whatever his more personal motives, Durkheim's explicit purpose is to distinguish socialism as a purely economic and political doctrine from the broader moral issues which have been confounded with it. The first lectures are devoted to a definition of it, and to its radical separation from all the moral Utopias, such as those of Plato, More and Campanella, which preceded it. Whereas these Utopian schemes aimed at the suppression of egoism by discounting material values, an aim betrayed by their basic communistic emphasis on the equal satisfaction of material interests, thereby shorn of their political significance, the essential trait of socialism is its determination to connect economic functions with political control, by identifying the organization of industry with government. So Durkheim is anxious to show that while the writings of social reformers in the eighteenth century, such as Morelly, Mably, Rousseau, Montesquieu and especially Linguet, prepare for the socialistic doctrine, they remain essentially communistic or moral in their intention; and he insists that socialism properly understood could not arise before 1803, when it was born as a doctrine counter to that of Adam Smith (introduced into France in that year by Say) but based on the same belief that economic and not moral objectives must be the foundation of social theory.

Doubtless such clear distinction and isolation of abstract principles from the more or less inchoate stream of public sentiment is imposed upon the scientific analyst of social history, though even this necessity scarcely seems to warrant the treatment of the distribution of industrial products and the welfare of the laborer as issues separable from or at most secondary to the constitutive principle of socialism; but the scientist who disengages in this way certain clearly conceptual principles must not be unconscious or forgetful of his own handiwork, and come to identify these underlying logical processes with the rich and confused pattern of social activity. Fortunately Durkheim's historical sense is stronger even than his rationalistic tendencies, and the summaries of the work of Sismondi, of Saint-Simon, and of his most important successor Bazard, are models of clear, just and concise exposition, and serve of themselves in some degree to correct the too rationalistic and partial analysis which introduced them.

The account of Saint-Simon occupies the larger half of the volume,

and corrects many a current misconception. Here we are shown how Saint-Simon, who never shared the atheistic attitude of the preceding generation, moved consistently from the view that an enlightened egoism supplies an adequate basis for social organization to an emphasis on religious and moral motivation; how he elaborated the whole positivistic theory, at least in outline, prior to the date of his friendship with Comte, who, while usually denying his debt, acknowledged it in private, and on one occasion at least in print; how the Comtean law of the three stages is explicitly present in his thought; how, far from repudiating the Revolution, he emphasized its necessity, and criticized it only because, after having cleared the ground of the ancient institutions, it stopped short of its real constructive social task; and finally how, while in his feeling and intention he had moved away from the eighteenth century, Saint-Simon retained its rationalistic mode of thought, seeking in the one concept of the completely industrialised state an all-sufficient social principle, and the key to moral and religious truth. Durkheim also makes clear in Saint-Simon the source of that conception of a scientific historical method which his pupil A. Thierry was to apply, and of that scientific sociology which Comte was to elaborate and Durkheim himself to revive after it had fallen into disrepute.

Saint-Simon had included in this "physiologie sociale" the conception of a social statics, the analysis of actual social conditions; but it was in the historical or genetic study of social forms that he found the means to an insight into the significance or direction of existing social conditions. So Durkheim presents in his turn this historical reconstruction of socialism as an illumination to be cast upon the socialism of his day; and in both cases one feels with distrust that the sociologist came to his genetic study suspiciously well oriented with regard to his subject, armed in advance with a knowledge of its essential nature. While for a genuinely empirical method the definition of his object is the scientist's last concern, often dispensed with altogether, the definition of socialism is for Durkheim his first thought, and the historical exposition is ostensibly to follow its guidance. We see how, where this guidance becomes actual, the exposition suffers.

Yet the method, with all its dangers, has its merits. Thus Durkheim shows how completely within the confines of a rationalistic philosophy remained the thought of Saint-Simon, for whom human society, the physical world, and God himself, are but aspects of one and the same logical plan. There is but one level of being, and we may pass by ratiocination from one part of it to another. Here, we might say,

Durkheim's initial hypothesis is verified by its illuminating power. But when we turn to the larger hypothesis of the study, which is that socialism stands wholly revealed by its history as the bare insistence that the organization of material interests is the whole task of society, and consequently that the motives of sympathy for the laboring poor, of hatred for selfcentered ambition, and of thirst for a closer and warmer social intimacy, serve neither to guide socialistic practice nor to give us understanding of what socialism means—here we must protest that the hypothesis has failed of verification, and the definition been shown to be inadequate. Such a definition of socialism leaves it open to the serious charges uttered by Durkheim, charges which its adherents would indignantly deny; nor does it illuminate the historical account. We must ask whether this undoubted emphasis by socialism on economic reorganization, while adequate perhaps to distinguish it from other reforming movements, gives us by itself a description of socialism which may serve as basis for its evaluation; and we may well suspect that the retention of the traditional dualism of economic and moral interests covers a confusion which precludes a scientific understanding of social motivations.

So Durkheim's critique of socialism provides material for a critique of the sociological method, which makes good its claims only in the degree that its conclusions are empirically coercive; but despite all such criticism, his study is a most lucid, informative and vigorous account of the Saint-Simonian movement, and one corrective of many traditional misconceptions.

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Philosophische Strömungen in Frankreich. By I. BENRUBI. Leipzig, Felix Meiner, 1928. Pp. viii, 530.

Les conceptions de la vie. By HARALD HÖFFDING. Translated by A. KOYRÉ. Paris, Félix Alcan, 1928. Pp. 170.

Les bases psychologiques de la vie morale. By D. PARODI. Paris, Félix Alcan, 1928. Pp. viii, 156.

De l'être. By LOUIS LAVELLE. Paris, Félix Alcan, 1928. Pp. 212.

Benrubi's survey of recent French thought appeared in English in an earlier and briefer version as *Contemporary Thought in France* (New York, Knopf, 1926). The present work retains the outline of its predecessor, but is considerably amplified in detail. It includes, for example, and for no good reason, the complete table of contents of the proceedings of the Société Francaise de Philosophie from its incep-

tion to the end of 1925. The author divides contemporary French philosophers into "empirical positivists", "critical" or "epistemological" idealists, and "metaphysico-spiritual positivists", the three groups including respectively the spiritual posterity of Comte, of Kant and Renouvier, and of Maine de Biran. The classification is superficial and its application hardly enlightening. Meyerson is to be found among the critical idealists, Lalande appears with the followers of Maine de Biran, and Brunschvicg turns up oddly at the end of a series in which his immediate predecessors include Couturat and Jean Nicod. The German version has rescued Gilson from the very heterogeneous group of "anti-Bergsonians" and given him a more positive status, with Maritain, as a "neo-Thomist". The change, if not wholly satisfying, is at least an improvement. This book contains useful compilations of names and bibliography. It does not present an illuminating analysis of the period it attempts to survey.

Professor Höffding's extension of his theory of the categories to the attractive and little-understood subject-matter of individual philosophies of life and of the meaning of life is a minor but not unimportant addition to his philosophy. It is the application of the primary category of totality—he tells us—to that complex and concrete material of experience which the narrower synthesis of science cannot include, which gives rise to such personal world-views. Such conceptions are diverse, individual, anthropomorphic. They express the poetry of life in its most spontaneous form, and can lay claim to no greater validity than such expression will warrant. But they are important elements in our notions of organism and of personality, and their place in metaphysics and religion is a large one. Their internal structure can be analysed, and this analysis is the central feature of the book. The natural expansion of our ideas through analogy with our own basic standpoints and tendencies—the progressive complication of the resulting view in its attempt to include as much as possible of the diversity of experience—the repetition of essential moments in some sort of ordered whole—these are the major stages in the development. As always, Professor Höffding's description includes a wide and generous reference to the best that has been accomplished in his field of investigation, and his tolerant appreciation of personal 'philosophies of life' in spite, or perhaps because of, their diversity exemplifies and justifies that *relativité philosophique* which is of the very essence of his own philosophy. The American reader will note with some interest the philosophic implication of Longfellow's *Psalm of Life* as the author here presents it.

When an idealist and a rationalist turns to the "psychological bases" of the moral life to find a ground for moral values and a standard by which we may judge them the result is likely to be interesting. Parodi's determination to go as far as possible with positivists and empiricists in this matter is obvious and laudable. Not on pure reason, but on the basic preferences implicit in vital tendency and activity, will he ground his moral theory. And not by an abstract final good but by the conditions and presuppositions of this activity itself will he estimate the meaning of the moral life. It is unfortunate, however, that M. Parodi brings to this investigation all the preconceptions of that Kantian doctrine of morality which still represents his own basic conviction on the matter. Hence we are not surprised to learn that vital tendency must be internally directed, that internal direction presupposes consciousness, that consciousness must be conceived on the analogy of our own clearest experience, as self-consciousness or judgment, and that to a consciousness thus conceived the rationalistic ideas of 'liberty' and 'universality' are as applicable as ever they seemed to the idealist to be. This universality is now based on the identity of human nature, to be sure, and its standards are translated when possible into sociological or even biological pseudonyms, but the essential structure of the argument is unaltered. The author's account of education in its relation to morality is perhaps the most valuable portion of the book. On the whole the book adds nothing essential to his position as already extensively outlined in *Le problème moral et la pensée contemporaine.*

De l'être is an ambitious treatment of a very extensive subject. The analysis is dialectical and purports to prove, among other things, that Being is all-inclusive, that thought and time are internal to it, that its ubiquitous reality is inescapably present in all its parts, since absence is always subjective, and the like. These are all highly important conclusions, if true, and the argument which supports them is often impressive. We may regret, therefore, that its extremely general and rarefied character makes it impossible to discover whether anything real corresponds to the terms of its analysis and consequently whether any of its assertions has even a chance of being true.

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Kritische Theorie der Formbildung. By LUDWIG BERTALANFFY. Berlin, Gebrüder Borntraeger, 1928. Pp. vi, 244.

Despite our rich knowledge of vital phenomena, we possess no completely established biological principle. Such terms as descent, selec-

tion, mechanism, and heredity, stand for large bodies of fact, but not for basic principles.

Mechanistic theories necessarily use concepts of activity, regulation, adaptation, organization, individuality and the like, all of them incompatible with the postulate that the same laws are valid for the organic and inorganic alike. Vitalism explains the mystery of life by something still more mysterious, and, in fact, substitutes a word for an explanation. It eschews scientific methods, and searches in the realms of the psychic or the metaphysical for a mystic formula that shall settle all problems. The selectionist principle is scarcely better, for every judgment respecting utility is necessarily subjective; there is no objective criterion whereby variations can be judged to have, or have not, selectionist value. Inheritance of acquired characteristics is an unproved hypothesis; and, when logically thought out, leads to vitalism with its objectionable implications. The principle of descent is almost equally dubious. The beautiful pictures of specific series ordered in a systematic unity have been shattered by recent studies, and about the only thing remaining is the conviction that there *must have been* an evolution of species. The persistence of Darwinism, Lamarckianism, and mutationism, as rival explanatory theories shows how little has been accomplished in determining the causes of evolution. The ever-growing complexity of the Mendelian theory makes it suspect, for its numerous auxiliary doctrines exhibit an uncanny similarity to the epicycles of Ptolemaic cosmogony. Moreover, the doctrine of unchanging genes, widely accepted among geneticists, implies a sort of special creationism and the virtual denial of evolution in the strict sense of the term.

We have, in addition, apparently insoluble conflicts in biological theory: mechanism and vitalism; Darwinism and Lamarckianism; geneticism and evolutionism, to mention no others; all of these presenting such complicated theoretical structures that a decision in favor of any view seems impossible.

Starting with such a diagnosis of the present situation, and insisting on the necessity of theoretical thought as the way out, Bertalannfy sets himself the task of determining the direction in which valid biological laws are to be sought. This undertaking must eventually cover all domains of biology, but Bertalanffy limits himself to a single field, the only one he deems ripe for such an exploratory study. That field is morphogenesis. Even here he modestly claims not to have solved but rather to have defined the fundamental problems.

The author lays down a number of assumptions as necessary guides

in theoretical studies of this sort. The causal, teleological and historical aspects of vital phenomena must all be treated. The morphological is largely identified in the present study with the teleological, but it is given an importance for biology transcending all others. Comprehensive causal interpretation is eventually necessary, however, if scientific predictions are to be possible. A fourth aspect, the ontological, falls within the province of the epistemologist, not the scientific biologist. The scientist must work on positivistic assumptions, not attempt to penetrate beneath the given and determine, for example, whether electrons, atoms and molecules are underlying realities. This rules out of consideration, for the natural scientist, any investigation of psychic or other imperceptible factors in the activities of the organism. Moreover, the material and the psychic are on different levels of reality, and it violates fundamental epistemological principles to put them together and mix natural science with psychology.

In developing his own theory of morphogenesis, Bertalannfy reviews relevant experimental data along with the more important theories now in the field. These include the machine, chemical, vitalistic and configurationist (*Gestalt* or *Ganzheit*) theories, with their several varieties. By way of summarizing his results, he presents the laws of morphogenesis in tabular form; and the logically possible theories are evaluated with these laws serving as criteria. Only one species of configurationism survives the ordeal, all other theories, especially mechanism and vitalism, being cast into the outer darkness. Many positive contributions are gleaned, however, from the work of authors sponsoring the unlucky theories, especially that of Driesch, who first demonstrated the autonomy of life, and also that of Goldschmidt, the first biologist to work out, experimentally and systematically, a chemical theory of morphogenesis.

Bertalannfy thus aligns himself with the organismic school of biological thought, and he shows some leanings toward the peculiar doctrines of emergent evolutionism. He is not ready to say just what organic *Gestalten* are; but he is sure they are not reducible, without residue, to inorganic phenomena, whether of the *gestaltliche* or any other variety. He is also sure that entelechies or other vitalistic factors, whether construed in a logical, psychological or metaphysical sense, have nothing to do with them. A *Gestalt* is an immanent factor bound up with the given organization of matter; it does not 'ingress' from some outer region and thereafter rule purposively and omnipotently, as the vitalists would have it.

As a critical survey of contemporary biological theories, especially in the field of morphogenesis, Bertalanffy's work should prove most valuable for those interested in fundamental problems, even though they disagree with his own interpretations. It represents a type of study, and a very necessary one, which is all too rare in this country, as does also the whole series of treatises on theoretical biology, under the editorship of Dr. Julius Schaxel, to which this volume is a contribution.

But Bertalannfy's own views are, of course, open to various criticisms, some of them serious ones. He concedes too much to Goldschmidt's chemical theory of morphogenesis in admitting that it offers a valid explanation of certain developmental processes, especially the phenomena of regulation. No purely chemical hypothesis can give a consistent account of the spatial, temporal, qualitative and quantitative relationships peculiar to all *vital* processes, including those of morphogenesis. This the author himself recognizes in another connexion.

Again, the criticisms of vitalistic conceptions are limited almost exclusively to those of Driesch, though Reinke's "dominants" are mentioned in various passages. Apparently it is not recognized that vitalistic conceptions radically divergent from those two are possible, and have, in fact, been propounded.

More serious are Bertalannfy's transgressions of limits indicated by his own methodological assumptions. He professes not to deal with ontological problems, but that does not deter him from damning entelechies or other alleged vitalistic factors at every opportunity. In this connexion he retails most of the stock objections to vitalism, many of them quite fallacious ones. He is much more lenient towards electrons and other physical entities. Had he been impartial, he would have condemned them equally with vitalistic factors; and had he been consistent with his positivistic assumptions, he would have ignored them all.

Most serious of all is his attempt to reach conclusions valid for the organism *as a whole*, from an examination of highly *selected* data. He does not profess to deal systematically with the teleological and historical aspects of vital phenomena, but nevertheless condemns theories that find their principle support in evidence from these categories. He also excludes from consideration the psychic side of life, but does not abstain from conclusions whose validity turns on psychical, equally with physico-chemical, phenomena. These criticisms do not apply with so much force to the author's special study of morphogenesis,

but even here the historical, the teleological and, in some fashion, the neural or psychological aspects of the phenomena must be considered, along with the physico-chemical and the *gestaltliche*, in any well-conceived attempt to work out a systematic theory.

All this, if true, means that a valid theory of life must deal with the historical, the physico-chemical, the teleological, the morphological, the psychological, and even the ontological problems involved; and that the resources of epistemology, of logical theory, of special methodologies, must all be utilized, so far as requisite, in the undertaking. Neither the scientific specialist nor the technical philosopher has as yet measured up to these requirements, and it may be that only a a new discipline, embracing both biology and philosophy, can do so.

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Kant—Sein System als Theorie des Kulturbewusstseins. By R. KYNAST. München, Ernst Reinhardt, 1928. Pp. 230.

Ein Weg zur Metaphysik. Ein Versuch über ihre Möglichkeit. By R. KYNAST. Leipzig, Felix Meiner, 1926. Pp. xiv, 354.

Although Dr. Kynast published *Ein Weg zur Metaphysik* first, we shall discuss it last. The reason for this procedure is that the book on Kant will throw light on *Ein Weg zur Metaphysik*.

Kant's interpreters may be divided into two classes: those who regard him as a destroyer of traditional metaphysics (*e.g.* Heine and Vaihinger) and those who look upon him as a constructive thinker in philosophy, a man sincerely interested in conserving the fundamental values of metaphysics. It is true that there is a revolutionary element in him, but it is to be found in the method by which he discovered the logical *a priori* in experience, and not in his attitude toward traditional metaphysics (p. 51).

As an interpreter of Kant Dr. Kynast belongs to the latter group. However, he is not satisfied with being a mere interpreter; he has a greater mission to perform—to propound a philosophy of his own, a philosophy centered around cultural values. The task he undertakes is to ground these values objectively. Since Kant was interested in conserving cultural values, he is to serve as a point of departure and a guide for Dr. Kynast. Consequently, the discussion of the book concentrates on the central ideas of Kant's philosophy, namely, such concepts as the world, the soul, God, around which center such values as truth, morality, religion, and beauty. That Kant was sincerely

interested in conserving and grounding these values objectively is evident from the fact that his main works are devoted to them.

In the *Critique of Pure Reason* we have the search for truth that shall be objectively and universally valid, even though Kant never asks the question, What is truth? He assumes that logic and the judgment give us truth. This assumption determines the form of the *Critique* and the nature of the proof advanced for the attainment of truth in human experience. Truth is possible in our experience of the objective world, because of the *a priori* element which we bring to it. In metaphysics, however, no such truth is attainable; hence we can only intimate the possible existence of the soul, God, freedom, and immortality, but never prove them.

In a similar manner the *Critique of Practical Reason* is interested in the objectivity and universality of our judgments with reference to morality. A moral judgment to be objectively valid must be universal. This universality the moral law gives us. When it is borne in mind that Kant was interested in conserving the cultural values, this law may be stated as follows: Act in such a way that the maxim of your will may have as its ultimate goal the unconditioned cultural values (p. 112).

If universality, and even necessity, hold sway in morality, what happens to human freedom? The answer is: freedom is a reality, because cultural values, which are contrary to nature, exist; and their existence could only be brought about by free agents.

How is it with the religious values? Are God and immortality real? Kant answers: since we have proved the reality of freedom, the existence of God, etc., is also made possible. The moral law, *e.g.*, commands that the will be absolutely good; it is, therefore, natural and rational to expect that such a good will be happy; for if happiness is to be found anywhere it ought to be found in beings of absolute good will. Experience, however, shows that this is not necessarily so. Yet we feel that virtue and happiness ought to be found together. Consequently, the conclusion is that there is a being who rewards the good with happiness. Since this happiness is not necessarily attained on earth, we conclude that it must be attainable in another life; therefore God and immortality exist. This God is all-wise, all-good, all-powerful; only such a being can reward the righteous. He is also a personal God with whom we may commune and in whom the cultural values are united. As a personal spirit, He is interested in human welfare and is constantly striving to produce the *civitas dei* (p. 165). In this Kantian conception of God as spirit Dr. Kynast sees the foreshadowing of Hegel's universal spirit (p. 200).

Our discussion up to this point indicates that for Dr. Kynast the Kantian philosophy forms a system, the central idea of which is a personal God in whom all cultural values are united. Since Dr. Kynast is interested in giving us a philosophy that will make our values objectively valid, he turns to Kant as a guide and has his system serve as the theory for our *Kulturbewusstsein*.

In *Ein Weg zur Metaphysik* Dr. Kynast is also in search of a unifying principle for our knowledge and cultural values. In the past human knowledge and values found their unity in metaphysics. Unfortunately this is no longer true. We have abandoned metaphysics because it rests on speculation and faith, and have taken refuge in science. We have looked to the sciences to provide us with the unifying principle of human knowledge and values, but so far they have failed to produce it. Nevertheless, we insist that our knowledge be unified; there is, therefore, only one thing left to do, and that is to return to metaphysics for this unifying principle. Hence Dr. Knyast's proposal to lead us back to metaphysics. However, he does nor propose to do this by elaborating a metaphysics of his own, but by showing the possibility and validity of it. To indicate its possibility we must make clear what it is. In the past it was looked upon as a science and even the science of sciences. However, whenever this lofty claim was made for it, it was soon questioned and even refuted. For Dr. Kynast, metaphysics is not a science nor the science of sciences, but a system of values. Since men have differed as to the highest value under which all others are to be subsumed, they have differed in metaphysics; hence the rival systems.

If metaphysics is a system of values, and if it is to be possible and valid, the judgments on which it rests must be valid, *i.e.* they must possess objectivity and universality. Logic assures us of this validity as far as the factual judgment is concerned, because this judgment makes objects possible and gives them existence. But how is it with the value-judgment? Does that have a similar validity? At first it would seem that this objectivity was lacking here, since the individual approves, disapproves, prefers, because the object pleases or displeases, has or has no value for him. Consequently, the value-judgment appears to be hopelessly subjective; yet it is not. First, value implies the 'ought' and so has objective reference. "Wert is irgendwie Gesolltes" (p. 139). "Wert ist gesollte Ordnung" (p. 149). Since values imply the 'ought', they have a permanent character; they are free from subjectivism and independent of time. To realize any system of values is an endless process. A value or a system of values is an ideal,

and as such cannot be fully realized in time. This gives it the 'oughtness'. Should it ever be realized in time, it would no longer imply the 'ought', because it would no longer be the ideal and so would no longer be "gesollt" (p. 149). In the second place, even if we grant that values are subjective, since they depend on the experiencing ego, the ego must be able to objectify its values. If the ego were not able to do this, it would be impossible for anyone to overcome the conflict between the ideal and the existing order. This would be subjectivism. If that were true, the individual would be only a value-bearer and not a value-realizer. But he is a value-realizer; he wills his values. As a value-realizer he reduces the conflict between the ideal and the real and so takes it out of the realm of the subjective into that of the objective (p. 200).

Since metaphysics is a system of values for Dr. Kynast, the question arises, what values enter into it? In the first place, it includes the different sciences and their fundamental concepts, as elementary values; consequently it can and does lay claim to knowledge. In the second place, it includes all other values, especially such as the true, the good, the beautiful, the holy (p. 231). All these are subsumed under a highest value or good. This highest good, according to Dr. Kynast, is identical with God, a personal God (p. 267). This God, in whom and through whom all things exist, is all-good, all-wise, all-powerful. The empirical ego does not have these characteristics in the same degree; consequently the empirical ego can know things only in part; and when it speaks of the totality of things it has to do so with an 'as if'. For this reason the empirical ego is driven to faith in its knowledge of ultimate reality, and for the same reason metaphysics must always rest on faith.

God, as the highest good, is the cause of everything. The existing world is his creation, or to put it another way, his temporal unfolding, since the world was potentially in God before its actual existence. But God, since he is all-knowing and personal, is not only the cause of the world, but the guiding power in the affairs of the world and the goal toward which all things move (pp. 260–70). This goal is the cultural ideal of the world or the *civitas dei*.

Dr. Kynast has done more than he set out to do; he has given us a metaphysical system which is like the philosophy set forth in his book on Kant. The reviewer does not consider this a disadvantage of the book, but rather an advantage; for, after all, if we are going to find not only *a* way but perhaps *the* way to metaphysics, we must construct metaphysical systems; this alone will lead us to metaphysics.

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On the Imagination. By Gianfrancesco Pico della Mirandola. With an introduction, an English translation, and notes, by Harry Caplan. New Haven, Yale University Press, 1930. Pp. xii, 102.

This is a very valuable publication. It furnishes us with an accurately printed text of this interesting essay and a clear, precise and most readable English version. The book can be of much service to the cultivated reader, especially as an indication of how close early sixteenth-century psychology was to thirteenth-century doctrines. The following remarks and criticisms are, therefore, prompted by a desire, not to diminish the value of the book, but, on the contrary, to add to its utility, the defects (as they seem to me) being almost negligible in number compared to the good qualities.

1. The text is accurately edited. However, I object to some of Professor Caplan's emendations. I believe, for instance, that on page 38 a very satisfactory sentence has been emended at the cost of grammatical accuracy. The text in Professor Caplan's edition reads: "Accidit enim plerumque ut eius ratio aut praepediatur morbo, aut somno detineatur, quae licet obfuscaretur <*non*>*numquam*. Ob id tamen, quod necesse est eum qui ratiocinatur et intelligit, eodem Aristotele auctore, phantasmata speculari, fatendum nobis, etc." If the sentence is properly punctuated it will, in due grammatical form, give the required sense in conformity with its Aristotelian source. A period should therefore be placed after *detineatur;* we should recall that *licet* is here a concessive conjunction; maintain *numquam* (instead of <*non*>*numquam*); and remove the period immediately after it. The sentence would then mean: "It often happens that man's reason is crippled by disease or halted by sleep. And *even granting that it never was obscured*, yet on account of the fact that he who reasons and understands must consider images (again on the authority of Aristotle), it must be admitted, etc."

Again, on page 28, in the sentence "imaginatio vero vana plurimum et oberrans; cuius *componende* gratia instans commentandi negotium suscepimus", Professor Caplan has changed *componende* to *componendi*, which cannot stand. The word is *componendae* (spelled according to the usage of the time); it agrees with *cuius* feminine (not neuter as the editor makes it) and standing for *imaginatio*; and it does not mean "for the sake of proving this", but "for the sake of regulating or correcting it [*i.e.* the imagination]".

On page 20 the following passage seems asyntactical: "Age igitur jam, Caesar optime, et excitis qua ratione potes Christianis regibus. Te Christo . . . ministrum exhibe." *Excitis* is a participle in

ablative-absolute construction with *regibus*. The period after *regibus*, therefore, should be removed.

On the other hand, there are passages in which the reading of the two early editions has been kept even where it seems to be untenable. So, for instance, on page 42, where we find the sentence "cui audiens hominem beat, *obaudiens* damnat" translated by Professor Caplan as "hearkening to this, imagination beatifies man; *disobedient* to it, imagination dooms him". But *obaudio* never meant *disobey*, but the very opposite of it. So, if the editor wants to keep his version he must emend to read <*in*>*obaudiens* (or *inoboediens*). So on page 58, in the sentence "id efficitur, cum ex rei cuiuspiam affectu illius spectrum simulacrumve, objectis abdicatisque ceteris conatu magno complectimur", where instead of *objectis* the sense demands *abjectis* (like Cicero's "abdico atque eicio"), Professor Caplan translates it as though the conjunction *que* were not there. I should also be inclined to doubt the correctness of the following (p. 88): "ut historias et bella mittamus, quibus *remorari* simul et delectari possunt". It is difficult to see what *remorari* (the editor translates it "By which they can be made to linger, charmed") has to do with the context. It seems as though we should read *rememorari* (a common transitive verb in psychological writings), in reference to the well-known function of history as "vita memoriae".

Something seems wrong with the passage (p. 96) which says "quod si Plato censuit eum non despici qui conatur ut iustus evadat", and which is translated as "If Plato held that a man is not to be despised who attempts to become upright". But having no texts or editions at my disposal it is impossible for me to make any suggestions. It might be worth while to reëxamine the early editions. There is one point which has aroused my curiosity, and that is in connexion with the word *sensile*. Pico apparently employs it in exactly the same sense in which the word *sensibile* had been invariably used, as the object of the sensitive faculty (*sensitiva*) with which a *natura sensualis* is endowed. Is it a genuine and a deliberate change or should we read it as an abbreviation for *sensibile*? As for the reading (p. 32) "sit potentia assimilandi cetera ad se ipsum", I suppose *ipsum* is a misprint for *ipsam*.

2. There are a few sentences in the translation which I might question. So, for instance, on page 18, where "ut est in votis" is translated "as the phrase reads in prayers", instead of "as it is my wish". And on page 28 "et ille quidem praesentibus dumtaxat sensilibus fit, etc." is rendered by "Sensation is caused by present objects provided

that they are sensible", which seems otiose. The passage should be translated as follows: "Sensation is caused by objects in so far as they are present" (in contrast with imagination, which operates in the absence of the object). So also on page 50 the sentence "diximus ante opinionum varietatem . . . ab ipsa ratione et intellectu (*qua* scilicet intellectus et ratio est) provenire non posse" cannot be translated as "I have said above that the variety of opinions . . . cannot come from reason itself and the intellect (wherever, be it understood, intellect and reason exist)". For how could it be supposed to come or not to come from reason if reason did not exist? What the passage means is: ". . . cannot come from reason itself and the intellect *as such.*" *Qua* has here the meaning with which the word has been introduced into English semi-technical parlance.

So on the same page in the passage "Si enim vitrea specilla diversis in locis ponantur, per quae ipsi oculo rei cuiuspiam imago monstretur *quamquam ea suapte natura una est*", the italicized phrase (and the similar one at the foot of the page) is translated: "although the object is of one and its own nature", whereas the clause means "although it in itself (or in its own nature) is one", the contrast being between the unity of the object and the multiplicity of its reproductions. On the same page (and also on page 62) *speculorum infectorum* does not mean "spoiled", but rather "colored" or "stained" glasses. On the next page, in the sentence "regionibus quoque aliis alias inesse corporum temperaturas conspicimus, *quae de ratione victus etiamnum immutantur*", the italicized phrase is translated as "these temperaments, moreover, are *not* changed by manner of life". But "immutantur" means "*are* changed", and that is exactly what Pico proceeds to illustrate a few lines below (beginning with "in eadem quoque regione, etc."). On page 54, in the sentence "sensus autem propriorum sensilium, quamquam aut semper verus aut rarissime falsus *in iis tamen quae subjecta sunt ipsis sensilibus* hoc est quibus accidunt ipsa sensibilia, fallitur saepenumero", the italicized phrase is translated as "in the things accessory to the sensibles themselves", whereas, if anything, we should rather have "the things *of which* the sensibles are accessories". *Subjecta* here has the regular scholastic meaning of substratum as a "support of accidents", which may be the substance itself or another more basic accident. And that this is the sense is shown by the phrase *quibus accidunt.* This is further borne out by what follows immediately after: "For example while we can correctly assert that the man who is approaching is black or white, if we declare positively that he is

James or John we shall very likely err and be deceived". In other words, sense tells the truth about the *accident* color (which is its proper object); it may err about the substance (John), that is, about the *subjectum* of which the color white is an accident. The same difficulty exists in the translation of "subjectis communibusque" on page 62.

On page 59 the sentence "qui de corporis temperatura manant morbi corporeis rebus curandi *et morbi ipsius naturae contrariis*" is translated as follows: "The disorders which arise from the temperament of the body are to be cured by bodily things, and *diseases of nature itself by their contraries*", which would result in a very strange kind of therapeutics. *Morbi* is genitive and not nominative; *contrariis* agrees with *corporeis rebus; naturae* is dative and not genitive; the phrase means: "The diseases which are caused by the temperament of the body must be treated with bodily things and with such things as are contrary to the nature itself of the disease".

Finally, on page 80 a rather serious heresy has crept into the translation of a perfectly orthodox passage. Speaking of the superiority of intellection over ratiocination, Pico says that the former "similior evadit Deo, qui *non per discursum, non per plures, easque simplices rerum notas speciesve (uti spiritus inferioris ordinis), non per unicam tantum* (ut supremi), sed per propriam eamque simplicissimam essentiam non modo res ipsas intelligit, etc.". Professor Caplan has translated the words in italics as follows: "Not by discursion, not by the many and simple signs and appearances of things (as with the spirits of an inferior order), not by the unique essence (as with the highest spirits), but by his own, and that the most simple, essence, God cognizes the things themselves, etc." He has interpreted *unicam* as though it referred to *essentiam*, whereas it refers to *species*. For God alone knows through his essence. All other intelligences know through *species;* which *species*, Pico says, are many for the lower spirits but one for the higher. It should also be recalled that these *species* are the *species intellectuales*, which cannot possibly be rendered into English by "appearances", they being for Pico the real object of the mind.

DINO BIGONGIARI

COLUMBIA UNIVERSITY

Pascal's Philosophy of Religion. By CLEMENT C. J. WEBB. Oxford, at the Clarendon Press, 1929. Pp. 116.

The present volume, like those previously published by the same author, combines much sound and unquestionable scholarship with a

freedom from rhetorical flourishes which, while rather expected from the author, may not strike every reader as equally meritorious. The author confesses, indeed, in his Preface, that the present volume, containing the substance of a course of lectures originally delivered in 1926, has been published "not without hesitation"; the hesitation apparently springing from Professor Webb's recognition of his lack of sympathy both with Pascal the man and with Pascal the thinker; and it should not, perhaps, be regarded as surprising if this lack of sympathy should to some extent show itself even in the manner in which the material is presented to the reader. Be that as it may, it must be regretted that a volume in many ways quite thoughtprovoking and instructive should so frequently show a lack of sympathetic insight, without which any work on a man as original as Pascal must appear as largely unsatisfying. Professor Webb wisely devotes the whole of his little volume to the study of Pascal's religious and theological ideas, thereby to some extent relieving a need long felt by the students of Pascal's thought. The treatment leaves little to be desired in the way of thoroughness, even if the all too frequent comparisons of Pascal with other thinkers, especially Kant, somewhat distort the actual perspective. But, while the reader may sometimes dissent from the author's conclusions, and while he also, at times, may desire a somewhat different treatment, he will find very little ground for criticism in the manner in which Professor Webb presents his own rather conservative conclusions, as their presentation throughout is characterized by modesty and restraint. The author does not believe that Pascal should be classed as a philosopher, partly because of his undeniable lack of philosophical erudition, partly because of his equally unquestionable lack of interest in philosophical problems *for their own sake*, and partly also, apparently, because of his pronounced antipantheism. Pascal, the author holds, was thus not a philosopher, but merely a man of science and a saint "whose greatness as a writer on religion is attributable to the genuineness and profundity of his religious experience combined with the wonderful artistry of his language; not, as it is sometimes supposed, to the clearness and accuracy of his thought *about* that experience". Among the most important chapters in the book are the two devoted, in part at least, to a discussion of Pascal's use of "le coeur" and to his attitude towards the so-called "proofs" for the existence of God. The former discussion, found in the fourth chapter, suffers somewhat by comparison with the late Max Scheler's brilliant remarks on the same subject in his *Ethik*, but even those who have read that still all-too-little known work may learn a

great deal from Professor Webb's more thorough, even if less profound, discussion. For one thing, Professor Webb shows conclusively that Pascal lacked the definiteness of conception so highly desirable in a philosopher. His use of the phrase "le coeur" is, at best, loose and indefinite; the meanings he gives to it are at times quite incongruous. His hostility to the traditional arguments for the existence of God is set forth quite well; yet it seems to the present reviewer that his striking modernity on this question does not receive anything like its due credit. Professor Webb recognizes, indeed, that there is a profound difference between the use made of the God-concept by the philosophers of the seventeenth century and those of the twentieth, but the discussion does not ,to my mind, bring out Pascal's originality here as clearly as a lover of Pascal's thought might wish. Professor Webb relates Pascal's criticism of the arguments from design to Kant's criticism of all the traditional "proofs"—more particularly the ontological—in a manner which not merely seems to detract from a due recognition of Pascal's originality, but which even appears somewhat misleading in its tendency. For Pascal, unlike Kant, did not so much object to these so-called "proofs" because of their logical weakness as because of their religious futility, because of their inability to arouse a thirst for God in those to whom they were addressed. There are, indeed, as the author shows, many curious similarities between Kant and Pascal, but the similarities he finds between Pascal's and Kant's attitudes towards these arguments seem to be much more superficial than he recognizes. In spite of these flaws in the author's discussion, the book as a whole must be classed as a work of real value. Without bringing to light anything not previously known, it succeeds in putting many things in a new light, or at least in a clearer light than they were before. For that reason one may safely recommend the book to all who are interested in the man whom I—in spite of Professor Webb—would venture to call the most interesting, if not the most original and profound, of all the French thinkers.

SVEN NILSON

UNIVERSITY OF OREGON

The Growth of Reason. By FRANK LORIMER. New York, Harcourt, Brace and Company, 1929. Pp. xii, 232.

It would be evident to the reader, even though he had not the author's word for it, that this work had been inspired by Dewey. But it is by no means a product of mere discipleship. Dr. Lorimer tells us (p. 4) that most of the positions taken in the course of it were not in his

mind when he began his study, but emerged in the actual handling of the material. And the book itself bears testimony to the truth of this statement. It is no cut and dried affair. A wide variety of material is handled before our eyes, and one conclusion after another is elicited while we look on. The treatment is empirical, tentative, and exceedingly suggestive. In short, Dr. Lorimer shows himself to be, after all, a worthy disciple of Dewey.

But if *The Growth of Reason* is empirical in its treatment, it is none the less philosophical in its setting and purpose. The metaphysical position of the author, a thoroughgoing naturalism, is explicitly formulated at the outset. "The processes and organization of communication are continuous with other physiological and social processes, and the evolving structure of intellectual activity (including the *forms* discovered by logical analysis) is a function of the total growth of mind prior to and including the growth of verbal activity; the structure and processes of intellectual activity, at all stages, are capable of systematic investigation and genetic interpretation" (p. 4). Mind in all its aspects is continuous with nature, and can be understood only as thus continuous, although just for this reason no complete account of it can ever be given.

Reason, as it exists in civilized adult man, is genetically continuous with the "organic intelligence" of the lower forms of life. Yet it differs profoundly in its structure from the intelligence of even the highest animals in that it is based on symbolic processes. Human intelligence is distinctively "free intelligence", *i.e.* "the capacity to experiment intellectually with situations not immediately perceived". This is directly dependent on the development of symbolic processes, chiefly on the growth of verbal activity. Speech is peculiarly fitted to play this rôle for several reasons. In the first place, it originates in the child in vocal play, or *lallen*, which, since the voice is only modified breathing, can be carried on without interfering with other activities. The infantile art of *lallen* rapidly takes on an auditory-vocal organization which is the basis for the imitation of vocal patterns socially established in language. While the earliest crying of the infant serves the simple social function of attracting the attention of others to its needs, the development of the auditory-vocal organization makes possible a great extension and transformation of this function. This takes place first through "nominal integration", or the integration of phonetic elements as conditioned reactions to specific situations, and as conditioned stimuli to specific types of social and personal behavior.

It is impossible in brief space to follow the author as he traces the stages of the growth of verbal activity in the child, and its intricate and profound interrelations with his development as a social person and a reasoning being. A few points of interest may be noted, however. The appearance of verbal activity is critical for the growth of reason precisely because language is symbolic. By this Dr. Lorimer means that 'words', in addition to being, as 'vocal acts', members of the functioning system of the organic individual, are also members of the social system in which the individual lives. 'Words' belong to socially instituted *languages*. Most writers on the subject fail, he thinks, to do justice to both of these aspects of the symbolic process, but an adequate conception of their mutual implications is absolutely essential to an understanding of the part speech plays in human life. Dewey, our author holds, is the writer who has most nearly done justice to this double rôle of verbal activity, but even he tends to overstate the extent to which the structure of human thinking is derived from discourse, and fails to give adequate recognition to the *organization* of intellectual processes prior to verbal activity. The growth of speech marks the development of a new type of structure—a set of schemata—on the basis of which mental life is *re*-organized, or *re*-constituted.

One of the distinctive and valuable features of the present work is the emphasis upon the indirectness of the relationship between thought and speech. There is no one-to-one correspondence between language and thought, nor even between linguistic structure and the structure of rational intelligence. In the child, verbal organization lags behind the organization of behavior and of intelligence generally; and an inferiority of verbal organization in one field may coexist with an elaborate verbal organization in others. As the author says (p. 95), "In one sense, the organization of symbolic activity *never* catches up with the complexity of experience." Yet, although the relationship is thus indirect, it is fundamental. If man can always experience and comprehend more than he can express in language, yet the fulness of what is experienced and comprehended is nevertheless determined by the range and organization of his linguistic activity.

There is doubtless much that a reviewer might find to criticize in the work. It deals summarily—one might almost say, offhand—with a vast range of profound issues. Yet if it rushes in at times where angels fear to tread, it has the virtues of its defects. It is, in many respects, a typical production of the younger generation of American thinkers. It is no finished piece of scholarship, but it is alive and it is original.

GRACE A. DE LAGUNA

BRYN MAWR COLLEGE

Platons Verhältnis zur Mathematik. By Seth Demel. Leipzig, Felix Meiner, 1929. Pp. 146.

In this excellent little book Dr. Demel traces in a convincing fashion the origin and development of Plato's interest in mathematics, from the earlier dialogues in which mathematics is looked upon only as a happy illustration of philosophical objectivity, to the mature insight of later years, when it becomes for Plato the connecting link between phenomena and the intelligible world, and the indispensable foundation of all natural science. Of special interest is Dr. Demel's view of the significance of the *Parmenides* as laying the foundation of the logic of mathematics, and his interpretation of the One and the Unlimited of the *Philebus* as pointing the way to the theory of infinitesimals and the thoroughgoing application of mathematics to the processes of change. Though Dr. Demel holds the view (hardly convincing on the evidence advanced) that Plato's serious acquaintance with mathematics began only after the Socratic period, he maintains that he was himself a mathematician of the first rank, no mere dilettante but an actual collaborator with Theaetetus and Eudoxus in the discoveries made by them while members of the Academy. Since their labors form an essential part of Euclid, Plato's influence upon mathematical thought has therefore been permanent and profound. It is out of the question, then, to interpret the interest in mathematics shown in his later thought as an experience of Pythagorean number-mysticism. It is equally erroneous to think that in his later years he identified mathematics and dialectic, for he always recognized the dependence of mathematical thought upon more ultimate principles—logical, metaphysical and even ethical. As a well-studied exposition of the true position of mathematics in Plato's thought, Dr. Demel's monograph will repay careful study.

Glenn R. Morrow

The University of Illinois

Condorcet. By Ferdinand Buisson. Paris, Félix Alcan, 1929. Pp. 138.

This collection of all-too-brief excerpts from the writings of Condorcet, with a short biographical sketch, belongs to the series of *Réformateurs sociaux* directed by Professor Bouglé of the Sorbonne in connexion with his manifold activities at the Centre du Documentation sociale of the École Normale Supérieure. It is the work of the versatile President of the Chamber of Deputies, whose notable oratorical style is given little scope in the twenty pages of introductory material.

"*Le bon*", "*le modeste*" Condorcet, that martyr to his own gospel of enlightenment whose gentle virtues amid the jungle of Revolutionary jealousies can easily be made tiresome, is known almost exclusively as the author of the astonishing *Esquisse d'un tableau historique des progrès de l'esprit humain*. Many readers will therefore be surprised to find that M. Buisson gives only ten pages out of more than a hundred to the *Esquisse*. He is more concerned to show us Condorcet the ally of Voltaire, the advocate of a comprehensive system of education for the young Republic, the calm counselor of moderation amid the battling Montagnards and Girondins. Like John Dewey, whom he resembles in so many respects, Condorcet wrote long and thoughtfully on education, which he, almost alone among his contemporaries, recognized as the key to permanence in political reforms. Boldly and persuasively he stated what has since become the ideal of the French laïcisers: each child, male and female alike, "*un élève de la patrie*", and thus immune to the wiles of the political or religious charlatan.

Condorcet the mathematician, the believer in salvation by statistics, the progenitor of Saint-Simon's and Comte's later "social physics", receives comparatively little attention. Condorcet the prophet is too fascinating. The idea of progress he neither invented nor established firmly, but he sang what he called the "sweet influence of knowledge" in winning future happiness in tones which have not ceased to be seductive. It may be, as a recent English critic of the eighteenth century remarks, that "only in the United States, where prosperity strangles criticism, do ideas of democracy and progress still command religious respect". But that is hardly the fault of Condorcet!

HAROLD A. LARRABEE

UNION COLLEGE

Das Experiment. Sein Wesen und seine Geschichte. By HUGO DINGLER. Muenchen, Verlag Ernst Reinhardt, 1928. Pp. 264.

Dr. Dingler adds in this work to his volumes on the logic and philosophy of science a fundamental treatment of the scientific experiment. His aim is to bring out in neo-Kantian fashion the *a priori* conditions which make experiment as such possible.

After a brief survey of the history of scientific thought, in which he endeavors to show that the effort of thinking in relation to the world is everywhere and always to reveal its constant, recurrent, and reproducible aspects, the author attacks in the main body of the book an analysis of the presuppositions of the experiment as an essential tool whereby scientific laws are established. The fundamental *a priori*

condition is the will in us to find stability of content and consistency of meaning in our world, without which the selection of data in such relations as yield enduring objects and recurrent causal sequences would be impossible to explain. This will expresses itself in certain *a priori* forms, such as the plane surface and the rigid body, which are involved and presupposed in any experimental procedure. Dr. Dingler's definitions of these forms are particularly interesting, in view of the fact that if he is correct Euclidean space is assumed in the formal structure of any experiment, and that therefore while non-Euclidean space may be conceived for purposes of theoretical mathematical calculation it could never be directly verified by physical experiment. This will be revealed at once in his definition of a plane; the latter is a surface whose two sides are, considered in themselves (*i.e.* without reference to surrounding objects), indistinguishable. By further use of the primary epistemological capacity to perceive likeness and difference he erects a considerable *a priori* system of forms by the aid of which we construct the world of scientific experience. This system is *a priori* in the strict Kantian sense that objects corresponding to these definitions are only possible in so far as our will for stability drives us into a process of selection, synthesis, and construction, in which the definitions function as implicit guides.

Like Dr. Dingler's other works, the book is a challenging statement of a point of view in the philosophy of science all too unfamiliar to the easygoing and uncritical empiricism dominant in English and American thinking. The two questions which insistently occur to a reader habituated to less *a priori* fashions are (1) the naturalistic question whether the will for constancy does not itself have natural causes, and (2) the realistic question whether the external material does not in part at least compel us to organize it in these forms rather than others. At any rate such a reader will wish that these questions were more adequately dealt with than is the case in the present volume.

E. A. Burtt

University of Chicago

Whewell's Philosophy of Induction. By Marion Rush Stoll. Lancaster, Lancaster Press, 1929. Pp. iv, 126.

In his recent work on *Les théories de l'induction et de l'expérimentation* Professor Lalande remarks on the surprising neglect of Whewell's contributions to the philosophy of science. Miss Stoll has seemingly done well, therefore, to devote a special study to this thinker. One gathers from her monograph that there are three reasons why Whe-

well's doctrines have attracted less attention than they perhaps deserve: (1) a diffuse, wearisome style; (2) a certain corresponding vagueness of conception; and (3) the overwhelming popularity of Empiricism. This vagueness of conception appears, for example, in the attempt to formulate certain Fundamental Ideas, akin in origin and function to Kantian categories. For as Miss Stoll points out, Whewell sometimes included in his list of such Ideas more particular conceptions, such as Force and Number, which at other times he recognized rather as differentiations of the more general conceptions.

But of more significance than all this, for the purposes of an objective evaluation of Whewell's thought, is the "heresy" that the laws of the physical sciences are necessary in the same sense as are the laws of mathematics and logic; and, moreover, that *all* knowledge is progressive in nature. Such being the case, it is hardly surprising that Whewell found no converts, in the England of his day and generation, to his unusual point of view. On the one hand, "the logician Mansel denied that the formal validity and necessity which belong to the truths of mathematics and logic can be claimed for the fundamental principles of the inductive sciences". On the other hand, "Mill and the other empiricists agreed that Whewell was wrong in attributing to these laws a universality and necessity which cannot be derived from mere experience" (p. 50). All the more reason, then, why Whewell's philosophy of science deserves to be examined afresh at the present time.

H. R. SMART

CORNELL UNIVERSITY

The following books were received during January and February:

Adventures in Philosophy and Religion. By JAMES BISSETT PRATT. New York, The Macmillan Company, 1931. Pp. x, 264.

The Faith of a Moralist. By A. E. TAYLOR. (2 Vols.) New York, The Macmillan Company, 1931. Pp. xx, 438: xxii, 438.

Introduction to the Theological Summa of St. Thomas. By GRABMANN-ZYBURA. St. Louis, B. Herder Book Co., 1931. Pp. x, 220.

The Autobiography of a Philosopher. By GEORGE HERBERT PALMER. Boston, Houghton, Mifflin Company, 1931. Pp. viii, 138.

Conditions and Consequences of Human Variability. By RAYMOND DODGE. New Haven, Yale University Press, 1931. Pp. xii, 162.

The Nature of Evil. By RADOSLAV A. TSANOFF. New York, The Macmillan Company, 1931. Pp. xviii, 448.

Religions and Philosophies in the United States of America. Compiled by JULIUS A. WEBER. Los Angeles, Wetzel Publishing Company, 1931. Pp. 334.

After 2000 Years. By G. LOWES DICKINSON. New York, W. W. Norton & Co., 1931. Pp. 214.

General Logic. By RALPH M. EATON. New York, Charles Scribner's Sons, 1931. Pp. xiv, 630.

The Adventure of Science. By BENJAMIN GINZBURG. New York, Simon & Schuster, 1931. Pp. xvi, 490.

The Person of Evolution. By W. D. LIGHTHALL. New York, The Macmillan Company, 1931. Pp. 216.

Personality. By A. A. ROBACK. Cambridge, Mass., Sci-Art Publishers, 1931. Pp. 144.

Christianity and Common Sense. By G. F. BRADBY. London, Oxford University Press, 1930. Pp. vi, 72.

The Spirit and Substance of Art. By W. L. FLACCUS. 2d Ed., New York, F. S. Crofts, 1931. Pp. xii, 484.

Buddhism in India, Ceylon, China and Japan. By CLARENCE H. HAMILTON. Chicago, University of Chicago Press, 1931. Pp. viii, 108.

A Defence of Philosophy. By RALPH BARTON PERRY. Cambridge, Harvard University Press. 1931. Pp. 56.

Solution of the World-Riddle. By INNOMINATUS. San Francisco, Harr Wagner Publishing Company, 1931. Pp. xxxii, 198.

A Philosophical Study of Mysticism. By CHARLES A. BENNETT. Reprinted with a Preface by RUFUS M. JONES. New Haven, Yale University Press, 1931. Pp. xvi, 194.

The Rôle of Kinesthesis in Maze Learning. By D. A. MACFARLANE. Berkeley, University of California Press, 1930. Pp. 277–304.

Degrees of Hunger, Reward and Non-Reward, and Maze Learning in Rats. By E. C. TOLMAN and C. H. HONZIK. Berkeley, University of California Press, 1930. Pp. 241–276.

The Free-Association Method and the Measurement of Adult Intelligence. By HERBERT S. CONRAD and DANIEL HARRIS. Berkeley, University of California, 1931. Pp. 46.

Conditions and Consequences of Human Variability. By RAYMOND DODGE. New Haven, Yale University Press, 1931. Pp. xii, 162.

L'hallucination. Philosophes et mystiques. By PIERRE QUERCY. Paris, Félix Alcan, 1930. Pp. xxxviii, 382.

L'hallucination. Études cliniques. By PIERRE QUERCY. Paris, Félix Alcan, 1930. Pp. 560.

La femme bengalie dans la litterature du Moyen-Âge. By J. HELEN ROWLANDS. Paris, Adrien Maisonneuve, 1931. Pp. viii, 244.

Morceaux choisis des penseurs français. By O. H. PRIOR. Paris, Librairie Félix Alcan, 1931. Pp. iv, 412.

L'orientation actuelle des sciences. By J. PERRIN, P. LANGEVIN, G. URBAIN, L. LAPICQUE, CH. PEREZ et L. PLANTEFOL. Paris, Félix Alcan, 1931. Pp. 156.

Bergson. By V. JANKÉLEVITCH. Paris, Félix Alcan, 1931. Pp. viii, 300.

Le langage et la pensée. By HENRI DELACROIX. 2d Ed., Paris, Félix Alcan, 1930. Pp. viii, 624.

Positivismus und reale Aussenwelt. By MAX PLANCK. Leipzig, Akademische Verlagsgesellschaft, 1931. Pp. 36.

Verhandlungen des ersten Hegelkongresses vom 22. bis 25. April 1930 im Haag. By B. WIGERSMA. Tübingen, J. C. B. Mohr, 1931. Pp. iv, 244.

Der Zusammenbruch des deutschen Idealismus bei den russischen Romantikern. By JOSEPH BILLIG. Berlin, Carl Heymanns, 1930. Pp. 64.

Mosaiken und Silhouetten. By JULIUS BAHNSEN. Leipzig, Johann Ambrosius Barth, 1931. Pp. xii, 194.

Empirische Soziologie. By OTTO NEURATH. Vienna, Julius Springer, 1931. Pp. 152.

Festschrift Th. G. Masaryk zum 80. Geburtstage. Zweiter Teil. By various authors. Bonn, Friedrich Cohen, 1930. Pp. xvi, 410.

Maestro e scolaro. By MARIO CASOTTI. Milan, Società Editrice "Vita E Pensiero", 1930. Pp. xiv, 328.

NOTES

The Department of Philosophy in the University of Toronto, under the instructions of the President, arranged a program of discussions and lectures on February 19 and two subsequent days. The speakers invited were Professor M. R. Cohen, Professor S. L. Joshi, Professor E. G. Spaulding. The visitors included Professor Hendel, Professor Porteous (McGill), Professor Humphrey (Queen's University). Lectures were given by Professor Joshi (Social and Political Aspects of Indian Philosophy) and Professor Cohen (The Distrust of Reason in Contemporary Thought). Meetings for discussion, attended by a large number of students and visitors, were conducted by Professor Cohen (Problems in Law and Morals) and Professor Spaulding (Is Idealism a final philosophy?). On Saturday morning at a special session Professor Spaulding gave an address on Freedom and Necessity, followed by general discussion.

At the annual meeting of the American Council of Learned Societies, held in New York City on January 30–31, the following resolution in memory of Dr. Allen Johnson was adopted:

When the plan for a *Dictionary of American Biography* of superior quality had been formed, and by the generosity of Mr. Adolph Ochs the means for adequate preparation of it had been provided, it was natural, in view of the intelligence, firmness, and efficiency with which Dr. Johnson had lately carried to a successful conclusion the editing of a large historical series, that the Committee of Management should ask him to be the editor-in-chief of the proposed *Dictionary*. He undertook the long task with enthusiasm, and brought to it a well-furnished and cultivated mind, large knowledge of American history and biography, experience, ripe judgment, literary taste, and a fixed determination that the highest practicable standards of accuracy, truthfulness, and just portraiture should be maintained. The praises which, from all quarters, have been bestowed upon the five volumes thus far published, show how well his ambitions for the *Dictionary* have been realized. His conduct of it has fairly surpassed the expectations of those who chose him to its charge.

With all the scholarship he brought to it from the academic world in which his life had hitherto been spent, he brought also a broad appreciation, not usual among academics, of the forces which have been at work in the American world at large, and of the varied characters, often unknown to literature, which have made that world what it is. Catholicity and discrimination in composing the list of names and in the selecting of writers for each, and good judgment in the apportionment of space, marked his work from the beginning. He resisted with firmness all pressure toward favoritism, ancestor-worship, or bias, in such arrangements. He applied to the manuscripts of contributors an alert and resourceful mind, checking excess or conventional eulogy, criticizing with severity and skill, insisting on solid and accurate workmanship. Yet despite the unsparing rigor with which he strove to ensure to the *Dictionary* the highest possible quality, his correspondence with con-

tributors abounded in appreciation, sympathy, and helpfulness, while his relations with his staff, as with all his friends, were made happy by constant kindness and generous and affectionate consideration.

At the same meeting Dr. Dumas Malone, who became co-editor of the *Dictionary* in the summer of 1929, was elected to the editorship. Dr. Harris E. Starr will continue with the *Dictionary* in the capacity of associate editor.

Professor George H. Sabine, of Ohio State University, has accepted a call to Cornell University as Professor of Philosophy. He will join the staff of the Sage School of Philosophy at the beginning of the academic year, 1931–1932.

Clifford L. Barrett, at present Assistant Professor and Chairman of the Department of Philosophy at the University of California at Los Angeles, goes to Princeton University next year as Assistant Professor of Philosophy.

The following is a list of articles in current philosophical periodicals:

MIND, XL, 157: *M. B. Foster*, The Concrete Universal: Cook Wilson and Bosanquet; *J. Hosiasson*, Why do we prefer Probabilities relative to many Data?; *C. A. Mace*, Faculties and Instincts; *C. E. M. Joad*, Physical Objects and Scientific Objects; *Richard Robinson*, Mr. Ryle on Propositions.

THE MONIST, XLI, No. 1: *Henry Margenau*, Causality and Modern Physics; *Kurt E. Rosinger*, A Realistic Study of the Foundations of Aesthetics; *Gustav Mueller*, Value and Evaluation of Beauty; *M. E. Spencer*, Spinoza and Nietzsche—A Comparison; *Everett W. Hall*, Bernard Bosanquet on the Psychical and the Logical Idea; *Edward O. Sisson*, A Preface to Logic; *John B. Kent*, Dr. Hasan's Direct Realism.

THE JOURNAL OF PHILOSOPHY, XXVIII, No 2: *Arthur E. Murphy*, Mr. Lovejoy's Counter-Revolution (1). 3: *Arthur E. Murphy*, Mr. Lovejoy's Counter-Revolution (2). 4: *Ernest Nagel*, Report of the Thirtieth Annual Meeting of the Eastern Division of the American Philosophical Association; *H. W. Wright*, Community as the Key to Evolution. 5: *Charles W. Morris*, Mind in "Process and Reality".

ANGLICAN THEOLOGICAL REVIEW, XIII, 1: *Rudolf Otto*, The Lord's Supper and its Celebration According to Evangelical Principles; *Margaret Münsterberg*, Out of Limbo; *N. W. Lund*, The Influence of Chiasmus upon the Structure of the Gospels; *Burton Scott Easton*, Professor Bacon's "Studies in Matthew"; *George A. Barton*, The Person of Christ in the Modern Literature Concerning His Life.

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